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TESTING
CNAS L0446

GRGTEST

Page 1 of 99

Test Report

Verified code: 848635

Report No.: E20230331478001-1

Customer: Lumi United Technology Co., Ltd

Address: Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China

Sample Name: Hub M3

Sample Model: HM-G01E

Receive Sample Date: Aug.02,2023

Test Date: Nov.29,2023 ~ Dec.05,2023

ETSI EN 301 489-1 V2.2.3 (2019-11)

ETSI EN 301 489-3 V2.3.2 (2023-01)

ETSI EN 301 489-17 V3.2.4 (2020-09)

EN 55032:2015+A11:2020

EN 55035:2017+A11:2020

EN IEC 61000-3-2:2019+A1:2021

EN 61000-3-3:2013+A2:2021

Test Result: Pass

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Issued Date: 2024-01-04

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REPORT ISSUED HISTORY

Report Version	Report No.	Description	Compile Date
1.0	E20230331478001-1	Original Issue	2023-12-13

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1. TEST RESULT SUMMARY

Emissions

Test Item	Test mode	Equipment test requirement	Test Method	Test Specification Level	Test Result
Radiated Emission	Mode 1 Mode 2 Mode 3	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.3.2 (2023-01) ETSI EN 301 489-17 V3.2.4 (2020-09)	EN 55032:2015 Table A.4 and A.5	Meet Standards Class B Limits	PASS
Radiated Emission	Mode 1 Mode 2 Mode 3	EN 55032:2015+A11:2020	EN 55032:2015 Table A.4 and A.5	Table A.4 Class B Table A.5 Class B	PASS
Conduction Emission	Mode 1 Mode 2 Mode 3	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.3.2 (2023-01) ETSI EN 301 489-17 V3.2.4 (2020-09)	EN 55032:2015 annex A.3	Table A.10 Class B	PASS
Conducted Emission	Mode 1 Mode 2 Mode 3	EN 55032:2015+A11:2020	EN 55032:2015 annex A.3	Table A.10 Class B	PASS
Asymmetric mode conducted emissions	Mode 2	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.3.2 (2023-01) ETSI EN 301 489-17 V3.2.4 (2020-09)	EN 55032:2015 annex A.3	Table A.12 Class B	PASS
Asymmetric mode conducted emissions	Mode 2	EN 55032:2015+A11:2020	EN 55032:2015 annex A.3	Table A.12 Class B	PASS
Harmonic current	Mode 1 Mode 2 Mode 3	ETSI EN 301 489-1 V2.2.3 (2019-11)/8.5 ETSI EN 301 489-3 V2.3.2 (2023-01)/7.1 ETSI EN 301 489-17 V3.2.4 (2020-09)/7.1.1	EN 61000-3-2:2014	Class A	PASS
Harmonic current	Mode 1 Mode 2 Mode 3	EN IEC 61000-3-2:2019+A1:2021	EN IEC 61000-3-2:2019+A1:2021	Class A	PASS
Voltage fluctuations and flicker	Mode 1 Mode 2 Mode 3	ETSI EN 301 489-1 V2.2.3 (2019-11)/8.6 ETSI EN 301 489-3 V2.3.2 (2023-01)/7.1 ETSI EN 301 489-17 V3.2.4 (2020-09)/7.1.1	EN 61000-3-3:2013	Meet Standards Limits For Pst, Tp = 10 min	PASS
Voltage fluctuations and flicker	Mode 1 Mode 2 Mode 3	EN 61000-3-3:2013+A2:2021	EN 61000-3-3:2013+A2:2021	Meet Standards Limits For Pst, Tp = 10 min	PASS

Immunity

Test Item	Test mode	Equipment test requirement	Test Method	Test Specification Level	Test Result
Electrostatic discharge (ESD)	Mode 1 Mode 2 Mode 3	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.3.2 (2023-01) ETSI EN 301 489-17 V3.2.4 (2020-09)	EN 61000-4-2:2009	Test specification: $\pm 2\text{kV}$, $\pm 4\text{kV}$, $\pm 8\text{kV}$ Air discharge $\pm 4\text{kV}$ Contact discharge Performance : Criteria B	PASS
		EN 55035:2017+A11:2020			
RF electromagnetic field (RS)	Mode 1 Mode 2 Mode 3	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.3.2 (2023-01) ETSI EN 301 489-17 V3.2.4 (2020-09)	EN 61000-4-3:2006+A1:2008+A2:2010	Test specification: Test level: For the frequency range 80MHz to 6000MHz, test level shall be 3V/m, 80% AM(1kHz) Performance: Criteria A	PASS
		EN 55035:2017+A11:2020			
Electrical fast transients(EFT)	Mode 1 Mode 3	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.3.2 (2023-01)	EN 61000-4-4:2012	Test specification: AC power port: $\pm 1\text{kV}$, repetition rate: 5 kHz Performance: Criteria B	PASS
		ETSI EN 301 489-17 V3.2.4 (2020-09)		Signal port: $\pm 0.5\text{kV}$, repetition rate: 5 kHz Performance: Criteria B	
	Mode 1 Mode 3	EN 55035:2017+A11:2020	IEC 61000-4-4:2012	Test specification: AC power port: $\pm 1\text{kV}$, repetition rate: 5 kHz Performance: Criteria B	PASS
				Signal port: $\pm 0.5\text{kV}$, repetition rate: 5 kHz Performance: Criteria B	
Surges	Mode 1 Mode 3	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.3.2 (2023-01) ETSI EN 301 489-17 V3.2.4 (2020-09)	EN 61000-4-5:2014+A1:2017	Test specification: AC power port: 1.2/50 us pulse line to line: $\pm 0.5\text{kV}$, $\pm 1\text{kV}$; Performance : Criteria B	PASS
Surges	Mode 1 Mode 3	EN 55035:2017+A11:2020	IEC 61000-4-5:2005	Test specification: AC power port: 1.2/50 us pulse line to line: $\pm 0.5\text{kV}$, $\pm 1\text{kV}$; Performance : Criteria B	PASS

Radio frequency continuous conducted(CS)	Mode 1 Mode 3	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.3.2 (2023-01) ETSI EN 301 489-17 V3.2.4 (2020-09)	EN 61000-4-6:2014	AC power port 0.15~80 MHz, 3Vrms, 80% AM, 1kHz Performance: Criteria A	PASS
	Mode 2			Signal port 0.15~80 MHz, 3Vrms, 80% AM, 1kHz Performance: Criteria A	
Radio frequency continuous conducted(CS)	Mode 1 Mode 3	EN 55035:2017+A11:2020	IEC 61000-4-6:2008	AC power port 0.15-10MHz:3V (r.m.s), 80%, 1kHz 10-30MHz:3-1V (r.m.s), 80%, 1kHz 30-80MHz: 1V (r.m.s), 80%, 1kHz Performance: Criteria A	PASS
	Mode 2			Signal port 0.15-10MHz:3V (r.m.s), 80%, 1kHz 10-30MHz:3-1V (r.m.s), 80%, 1kHz 30-80MHz: 1V (r.m.s), 80%, 1kHz,, 1kHz Performance: Criteria A	
Power frequency magnetic field	Mode 1 Mode 2 Mode 3	EN 55035:2017+A11:2020	IEC 61000-4-8:2009	1A/m 50Hz and 60Hz Performance Criterion A	PASS
Voltage Dips & Short Interruptions	Mode 1 Mode 3	ETSI EN 301 489-1 V2.2.3 (2019-11) ETSI EN 301 489-3 V2.3.2 (2023-01) ETSI EN 301 489-17 V3.2.4 (2020-09)	EN 61000-4-11:2004	Test specification: 1. Voltage dips: i) 0% residual voltage 0.5 cycle. Performance: Criteria B; ii) 0% residual voltage 1 cycle, Performance: Criteria B; iii) 70% residual voltage 25 cycle. Performance: Criteria C; 2. Voltage interruption: 0% residual voltage during 250 cycles. Performance: Criteria C	PASS

Test Item	Test mode	Equipment test requirement	Test Method	Test Specification Level	Test Result
Voltage Dips & Short Interruptions	Mode 1 Mode 3	EN 55035:2017+A11:2020	IEC 61000-4-11:2004	Test specification: 1. Voltage dips: i) 0% residual voltage 0.5 cycle. Performance: Criteria B ii) 70% residual voltage 25 cycle for 50Hz Performance: Criteria C 2. Voltage interruption: 0% residual voltage during 250 cycles for 50Hz. Performance: Criteria C	PASS

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2. GENERAL DESCRIPTION OF EUT

2.1 APPLICANT

Name: Lumi United Technology Co., Ltd

Address: Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China

2.2 MANUFACTURER

Name: Lumi United Technology Co., Ltd

Address: Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China

2.3 BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Product Name: Hub M3

Product Model: HM-G01E

Adding Model: HM-G01D

Model difference description: The model NO. HM-G01E & HM-G01D have the same technical construction including circuit diagram, PCB LAYOUT, hardware version and software version identical, except sales area and packaging are different.

Trade Name: Aqara

Power supply: DC 5V/2A or DC 48V/0.27A power by PoE

2412MHz - 2472MHz for IEEE 802.11b/g/n HT20

2422MHz - 2462MHz for IEEE 802.11n HT40

5180MHz-5240MHz & 5745MHz~5825MHz for IEEE 802.11a/n HT20/ac VHT20;

5190MHz-5230MHz & 5755MHz~5795MHz for IEEE 802.11n HT40/ac VHT40;

5210MHz & 5775MHz for IEEE 802.11ac VHT80

2402MHz - 2480MHz for Bluetooth LE with 1M&2M

2405MHz - 2475MHz for Zigbee & Thread

Sample submitting way: ■Provided by customer □Sampling

Sample No: E20230331478001-0005

Note 1: The EUT antenna gain is provided by the applicant. This report is made solely on the basis of such data and/or information. We accept no responsibility for the authenticity and completeness of the above data and information and the validity of the results and/or conclusions.

Note 2: All the tests were performed on the model HM-G01E.

2.4 TEST MODE

Mode No.	Description of the mode
Mode 1	AC-DC Adapter + 2.4G Wi-Fi ping network + BLE subdevice + Zigbee subdevice + Thread subdevice
Mode 2	PoE Adapter + ping network + BLE subdevice + Zigbee subdevice + Thread subdevice
Mode 3	AC-DC Adapter + 5G Wi-Fi ping network + BLE subdevice + Zigbee subdevice + Thread subdevice

2.5 EUT OPERATING DESCRIPTIONS

No.	Operating description
Mode 1	The EUT is connected to the adapter for power supply, and the EUT is connected to the 2.4G wireless network of the router through the aqara home software on the mobile phone. The laptop is connected to the router's wireless network and pinged with the EUT's IP network. The EUT uses aqara home software to add zigbee protocol subdevices (Magic cube controller), thread protocol subdevices (Door and window sensor), and BLE protocol subdevices (Mobile Phone), and check the connection status of each subdevices on the aqara home software of the mobile phone.
Mode 2	The EUT is connected to the PoE adapter for power supply, and the EUT is connected to the router network through the aqara home software pairing on the mobile phone. The laptop is connected to the router through a network cable and pinged with the EUT's IP address. The EUT uses aqara home software to add zigbee protocol subdevices (Magic cube controller), thread protocol subdevices (Door and window sensor), and BLE protocol subdevices (Mobile Phone), and check the connection status of each subdevices on the aqara home software of the mobile phone.
Mode 3	The EUT is connected to the adapter for power supply, and the EUT is connected to the 5G wireless network of the router through the aqara home software on the mobile phone. The laptop is connected to the router's wireless network and pinged with the EUT's IP network. The EUT uses aqara home software to add zigbee protocol subdevices (Magic cube controller), thread protocol subdevices (Door and window sensor), and BLE protocol subdevices (Mobile Phone), and check the connection status of each subdevices on the aqara home software of the mobile phone.

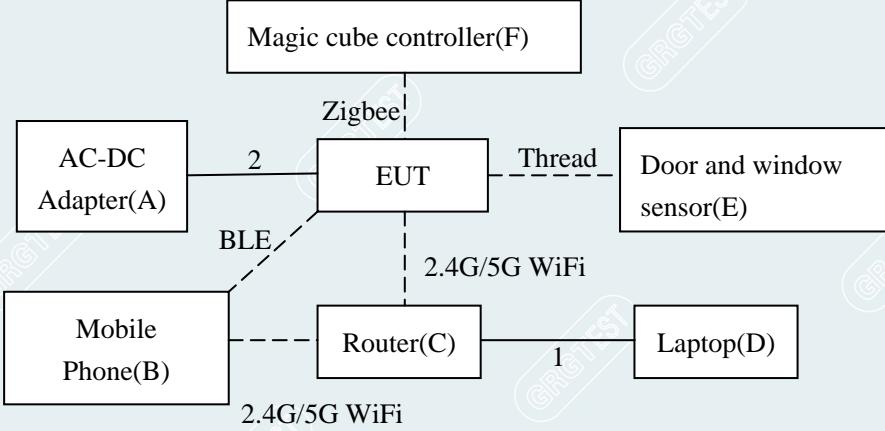
2.6 LOCAL SUPPORTIVE INSTRUMENTS

No.	Name of Equipment	Manufacturer	Model	Serial Number
A	AC-DC Adapter	Aohai	A70-050200U-EU1	/
B	Mobile Phone	OPPO	R11S	/
C	Router	ASUS	GT-AXE11000	M8IG0X401513EYM
D	Laptop	DELL	Latitude 3420	/
E	Door and window sensor	Aqara	P2	/
F	Magic cube controller	Aqara	T1	/
G	PoE Adapter	UE	PoE35-54A	/

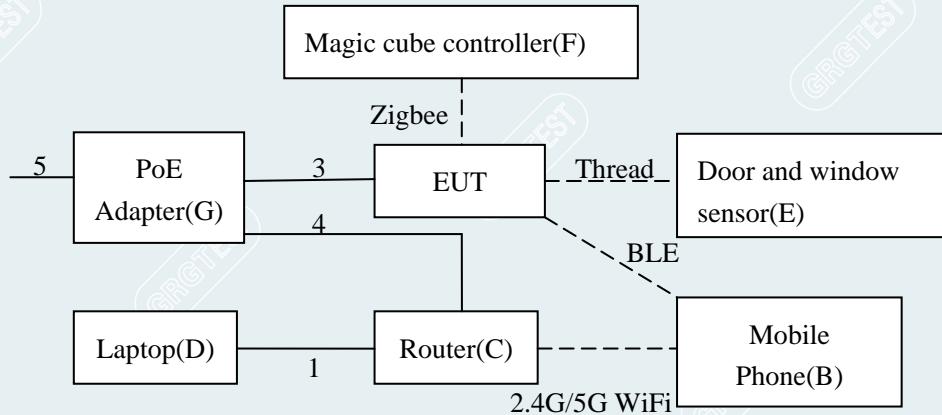
No.	Cable Type	Qty.	Shielded Type	Ferrite Core(Qty.)	Length
1	RJ45 cable	1	No	0	2.0m
2	USB-C cable	1	Yes	0	1.0m
3	RJ45 cable	1	No	0	2.0m
4	RJ45 cable	1	No	0	2.0m
5	AC cable	1	No	0	2.0m

2.7 CONFIGURATION OF SYSTEM UNDER TEST

Mode 1&Mode 3:



Mode 2:



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3. LABORATORY AND ACCREDITATIONS

3.1 LABORATORY

The tests & measurements refer to this report were performed by Shenzhen EMC Laboratory of GRG METROLOGY & TEST GROUP CO., LTD.

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3.2 ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

China	CNAS(L0446)
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Copies of granted accreditation certificates are available for downloading from our web site,
<http://www.grgtest.com>

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4. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Uncertainty
Conduction Emission	150kHz~30MHz	3.3dB ¹⁾
Asymmetric mode conducted emissions $\alpha_{LCL}=55 \dots 40$ dB of AAN ³⁾	150kHz~30MHz	4.1dB ¹⁾
	150kHz~30MHz	4.5dB ¹⁾
	150kHz~30MHz	5.0dB ¹⁾
Radiated Emission	30MHz~200MHz(H)	4.6dB ¹⁾
	200MHz~1000MHz(H)	4.8dB ¹⁾
	30MHz~200MHz(V)	4.7dB ¹⁾
	200MHz~1000MHz(V)	4.7dB ¹⁾
	1GHz~6GHz(H)	5.0dB ¹⁾
	1GHz~6GHz(V)	5.1dB ¹⁾
Harmonic Current	/	2)
Voltage Fluctuation and Flicks	/	2)
Electrostatic discharge	/	2)
Radio-Frequency Electromagnetic Field	/	2)
Electrical Fast Transient/Burst	/	2)
Surge	/	2)
Conducted radio frequency disturbances	/	2)
Power frequency magnetic field	/	2)
Voltage Dip & Voltage Interruptions	/	2)

¹⁾ This uncertainty represents an expanded uncertainty expressed at approximately the 95%.

This uncertainty represents an expanded uncertainty factor of $k=2$.

²⁾ Tests have proved that, test system meet the requirements of the standard with a confidence level of not less than 95%.

³⁾ α_{LCL} starts at 150 kHz with a value of 55 dB (respectively 65 dB or 75 dB), varies with frequency and reaches a value of 40 dB (respectively 50 dB or 60 dB) at 30 MHz.

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5. LIST OF USED TEST EQUIPMENT AT GRGT

5.1 LIST OF USED TEST EQUIPMENT

Name of equipment	Manufacturer	Model	Serial number	Calibration due
Radiated Emission (Below 1GHz)				
Test S/W	EZ	CCS-03A1	/	/
Test Receiver	R&S	ESR7	102444	2024-08-11
Preamplifier	EMEC	EM330	I00426	2024-02-06
Bi-log Antenna	TESEQ	CBL6143A	26039	2024-07-17
Radiated Emission (Above 1GHz)				
Test software	Tonscend	JS32-RE	/	/
Test Receiver	R&S	ESR26	101758	2024-09-22
Preamplifier	Tonscend	TAP01018048	AP20E8060075	2024-04-11
Preamplifier	SHIRONG ELECTRONIC	DLNA-1G18G-G40	20200928005	2024-08-17
Horn antenna	Schwarzbeck	BBHA 9120D	02143	2024-09-23
Conduction Emission				
Test software	EZ	CCS-3A1-CE	/	/
Test Receiver	R&S	ESCI	100783	2024-08-11
LISN(EUT)	R&S	ENV216	101543	2024-08-03
ISN	TESEQ	ISN-T8-CAT6	39886	2024-08-20
ISN	TESEQ	ISN T400A	25654	2024-08-28
Harmonic Current				
Test S/W	/	CTS4	/	/
Power Source	SCHAFFNER	NSG1007	54789	2024-02-09
Harmonic & Flicker Tester	SCHAFFNER	CCN1000	72045	2024-07-14
Voltage Fluctuation and Flicks				
Test S/W	/	CTS4	/	/
Power Source	SCHAFFNER	NSG1007	54789	2024-02-09
Harmonic & Flicker Tester	SCHAFFNER	CCN1000	72045	2024-07-14
Electrostatic discharge				
Dito ESD Simulator	EM Test	dito	V0809103493	2024-09-21

Radio-Frequency Electromagnetic Field				
Test S/W	Tonscend	JS35-RS	/	/
Signal generator	R&S	SMA100A	100434	2024-07-09
Switch	TOYO	BS5000	/	/
Power Meter	Keysight	N1914A	MY57090009	2024-09-25
Power Probe	Keysight	E9301A	MY57060008	2024-07-09
Power Probe	Keysight	E9301A	MY56520006	2024-07-09
Log-periodic broadband antenna	Schaffner	CBL6143	5082	2024-12-02
Dual directional Coupler	AR	DC 6180A	0328212	2024-08-11
Power Amplifier	SCHAFFNER	CBA9433	3007	2024-09-22
Microwave Log.-Per. Antenna	Schwarzbeck	STLP9149	9149-163	2024-08-26
Power Amplifier	Milmega	AS1860-50	1079232	2024-03-02
Power Amplifier	TESEQ	CBA 3G-050	T44161	2024-03-02
Dual directional Coupler	AR	DC 7144A	327057	2024-08-11
Electrical fast transient/burst				
EFT/Surge generator	3Ctest	CCS 1000	ES014001420001	2024-07-31
Coupled decoupling network	3Ctest	SEPN 1000T	ES066000920001	2024-07-31
Capacitive coupling clamp	TESEQ	CDN8014	26192	2024-07-14
Surge				
Surge generator	3Ctest	CWS 600G	ES0381813	2024-09-08
Coupled decoupling network	3Ctest	SPN 3618T	ES0941720	2024-09-08
Conducted radio frequency disturbances				
Test S/W	Tonscend	JS35-CS	/	/
Signal Generator	TESEQ	NSG4070	25807	2024-03-02
Attenuator	weinschel corp	40-6-34	QQ986	2024-07-06
CDN	TESEQ	CDNM316	24517	2024-10-12
CDN	TESEQ	CDNT800	34427	2024-02-16

Voltage Dip & Voltage Interruptions				
Test S/W	AMETEK	AC Source CIGuiSII-500lix	2.0.0.7-No v.2006	/
Power Source	SCHAFFNER	NSG1007	54789	2024-02-09
AC Switching Unit	TESEQ	NSG2200-1	A17820	2024-07-14
Power frequency magnetic field				
Test S/W	TESEQ	Win2120 Ver6.00	/	/
Power Source	SCHAFFNER	NSG1007	54789	2024-02-09
Signal generator	SCHAFFNER	INA2141	6003	2024-07-14
Induction coil Interface	SCHAFFNER	INA-702	711-1115	2024-07-14

Note: The calibration interval of the test instruments is 12 months.

----- The following blanks -----

6. EMISSION TEST

6.1 RADIATED EMISSION MEASUREMENT (RE)

Test Requirement: ETSI EN 301 489-1
 ETSI EN 301 489-3
 ETSI EN 301 489-17
 EN 55032

Test Method: EN 55032

6.1.1 LIMITS

The ancillary equipment shall meet the class B limits given in CENELEC EN 55032 [1], annex A tables A.4 and A.5.

Table A.4 – Requirements for radiated emissions at frequencies up to 1 GHz for class B equipment

Frequency range(MHz)	Distance (m)	Bandwidth	Limits (dBuV/m)		
			Peak (PK)	Quasi-peak (QP)	Average (Avg)
30~230	3	120kHz	/	40	/
230~1000	3	120kHz	/	47	/

Table A.5 – Requirements for radiated emissions at frequencies above 1 GHz for class B equipment

Frequency range(MHz)	Distance (m)	Bandwidth	Limits (dBuV/m)		
			Peak (PK)	Quasi-peak (QP)	Average (Avg)
1000~3000	3	1MHz	70	/	50
3000~6000	3	1MHz	74	/	54

----- The following blanks -----

6.1.2 TEST PROCEDURE

(1) Procedure of Preliminary Test

Radiated emission tests shall be made with the receive or transmit antenna located at a horizontal distance of 3m or 10m plus half of the maximum width of the EUT being tested, measured from the centre of the EUT. The tests shall be performed with the equipment configured as closely as possible to its typical, practical operation. Unless stated otherwise, cables and wiring shall be as specified by the manufacturer and the equipment shall be in its housing (or cabinet) with all covers and access panels in place. Any deviation from normal EUT operating conditions shall be included in the test report.

The EUT (on a non-conductive support structure, where applicable) shall be placed on a remotely operated turntable, to allow the EUT to be rotated. The height of the EUT above the ground plane shall be according to the following requirements.

-- Table-top equipment is placed on a non-conductive set-up table with height $0.8\text{ m} \pm 0.01\text{ m}$, CISPR 16-1-4 specifies the method to determine the impact of the non-conductive set-up table on test results.

-- Floor-standing equipment is placed on a non-conductive support, as specified in the applicable product standard. If there are no EUT height placement requirements in the product standard, the EUT shall be placed on a non-conductive support at a height of 5 cm to 15 cm above the ground plane.

Note: This is table-top equipment.

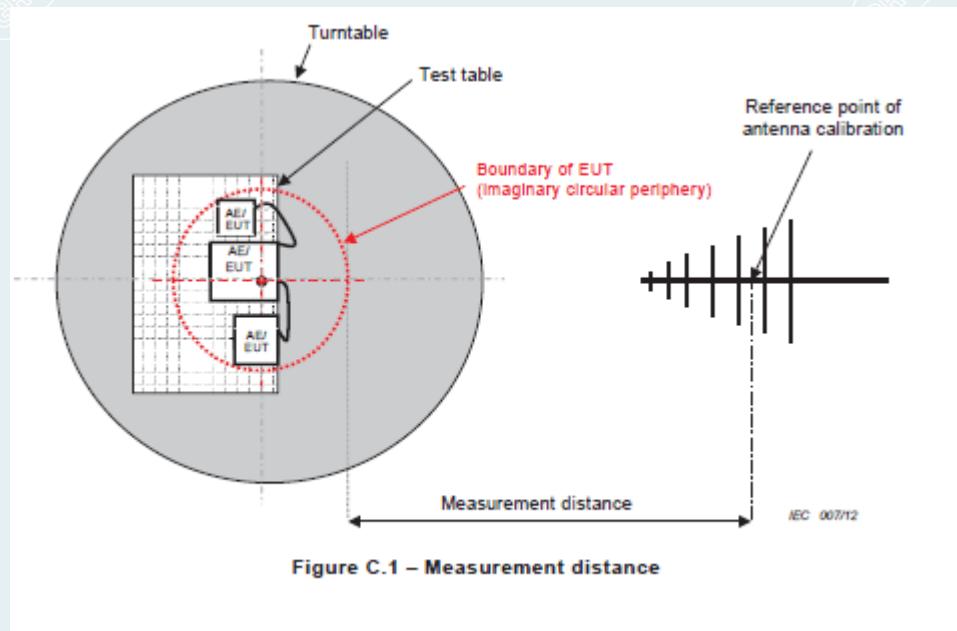
Interface cables, loads, and devices should be connected to at least one of each type of the interface ports of the EUT and, where practical, each cable shall be terminated in a device typical for its actual use. Where there are multiple interface ports of the same type, a typical number of these devices shall be connected to devices or loads. It is sufficient to connect only one of the loads, provided that it can be shown, for example by preliminary testing, that the connection of further ports would not significantly increase the level of disturbance (that is, more than 2 dB) or significantly degrade the immunity level.

The test mode(s) were scanned during the preliminary test. After the preliminary scan, we found the test mode producing the highest emission level. The EUT and cable configuration, antenna position, polarization and turntable position of the above highest emission level were recorded for the final test.

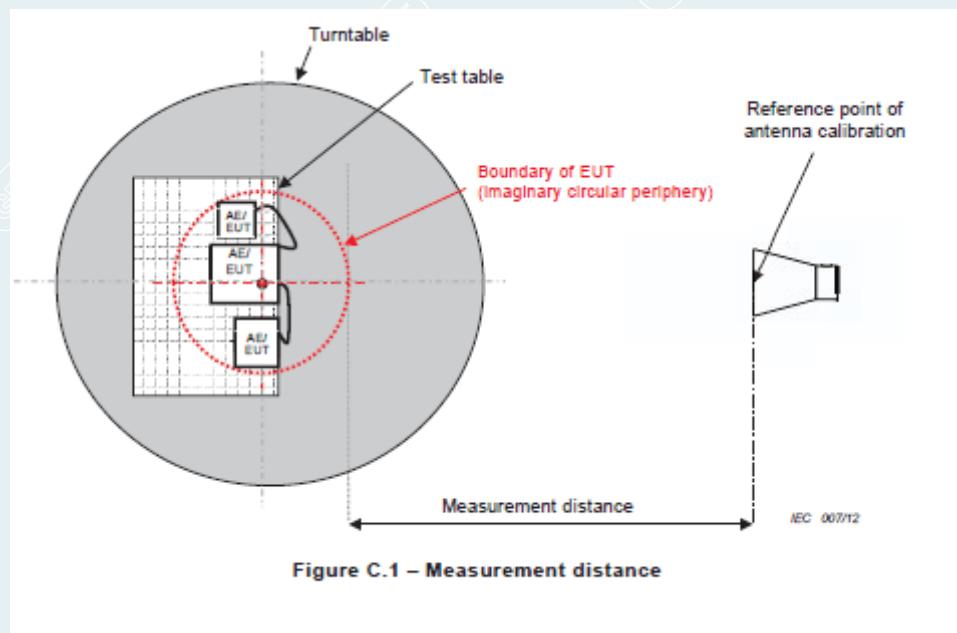
(2) Procedure of Final Test

EUT and support equipment were set up on the turntable as per the configuration with highest emission level in the preliminary test. The Analyzer/ Receiver scanned from 30MHz to 1000MHz and 1000MHz to 6000MHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level. Record at least six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and for 30MHz~1000MHz only QP reading is presented, for 1000MHz~6000 MHz Peak and AVG reading is presented.

6.1.3 TEST SETUP



Below the frequency of 1GHz



Above the frequency of 1GHz(1GHz-6GHz)

6.1.4 DATA SAMPLE

Below 1GHz

Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Heigh (cm)	Detectorype
XXX.XXXX	48.49	-9.91	38.58	47.00	-8.42	100	108	QP

Frequency (MHz) = Emission frequency in MHz
 Reading (dBuV) = Uncorrected Analyzer / Receiver reading
 Correct Factor (dB/m) = Antenna factor + Cable loss – Amplifier gain
 Result (dBuV/m) = Reading (dBuV) + Correct Factor (dB/m)
 Limit (dBuV/m) = Limit stated in standard
 Margin (dB) = Result (dBuV/m) – Limit(dBuV/m)
 QP = Quasi-peak Reading

Above 1GHz

Frequency (MHz)	Reading (dBuV/m)	Level (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Margin (dB)	Heigh (cm)	Angle (deg.)	Remark
XXXX	56.70	34.18	-22.52	74	39.82	100	23	Peak
XXXX	46.34	23.80	-22.54	54	30.20	100	214	AVG

Frequency (MHz) = Emission frequency in MHz
 Reading (dBuV) = Uncorrected Analyzer / Receiver reading
 Factor (dB) = Antenna factor + Cable loss – Amplifier gain
 Level (dBuV/m) = Reading (dBuV/m) +Factor (dB)
 Limit (dBuV/m) = Limit stated in standard
 Margin (dB) = Limit(dBuV/m)- Level(dBuV/m)
 Peak = Peak Reading
 AVG = Average Reading

6.1.5 PHOTOGRAPH OF THE TEST ARRANGEMENT

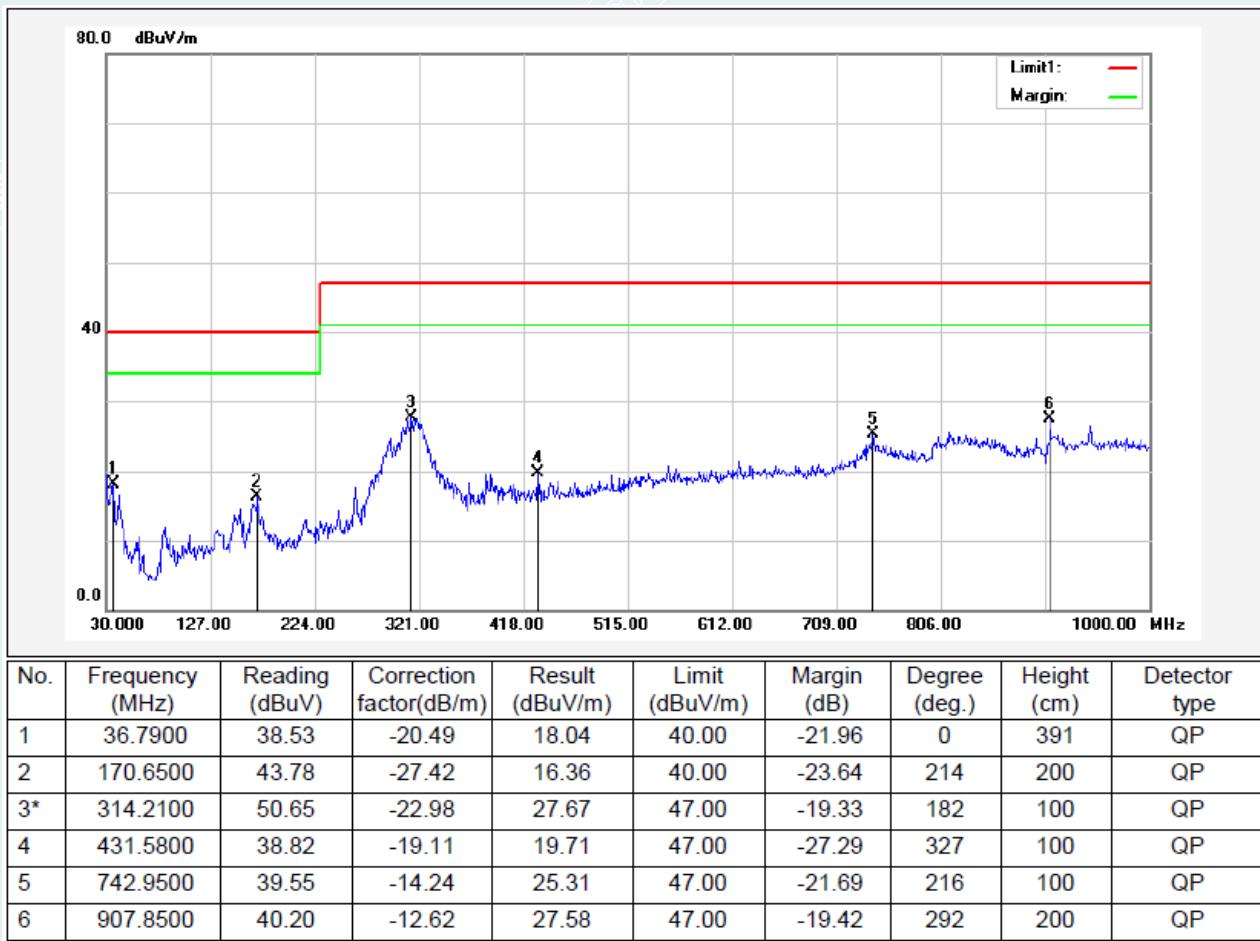
Please refer to the attached document E20230331478001-28 CE-Test Photo.

6.1.6 TEST RESULTS

Below 1GHz

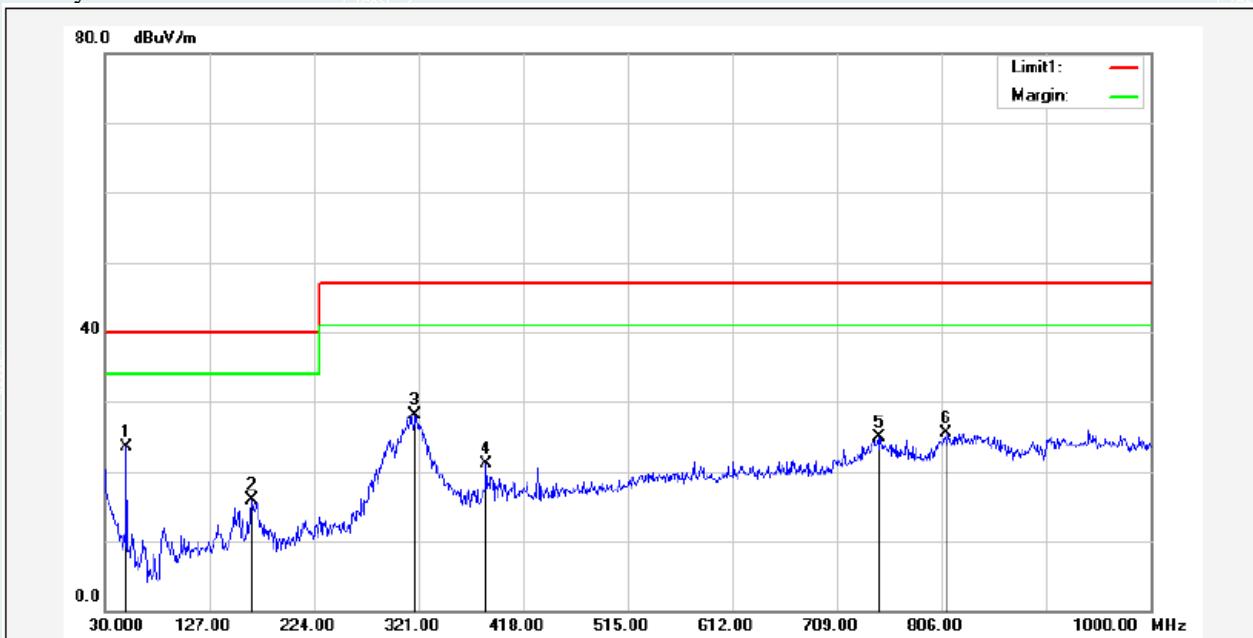
EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	22.6°C/51%RH/101.0kPa	Test Mode	Mode 1
Power supply	AC 230V/50Hz	Tested By	Yin Xiaogang
Test Date	2023-12-01	Sample No.	E20230331478001-0005

Polarity: Horizontal



EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	22.6°C/51%RH/101.0kPa	Test Mode	Mode 1
Power supply	AC 230V/50Hz	Tested By	Yin Xiaogang
Test Date	2023-12-01	Sample No.	E20230331478001-0005

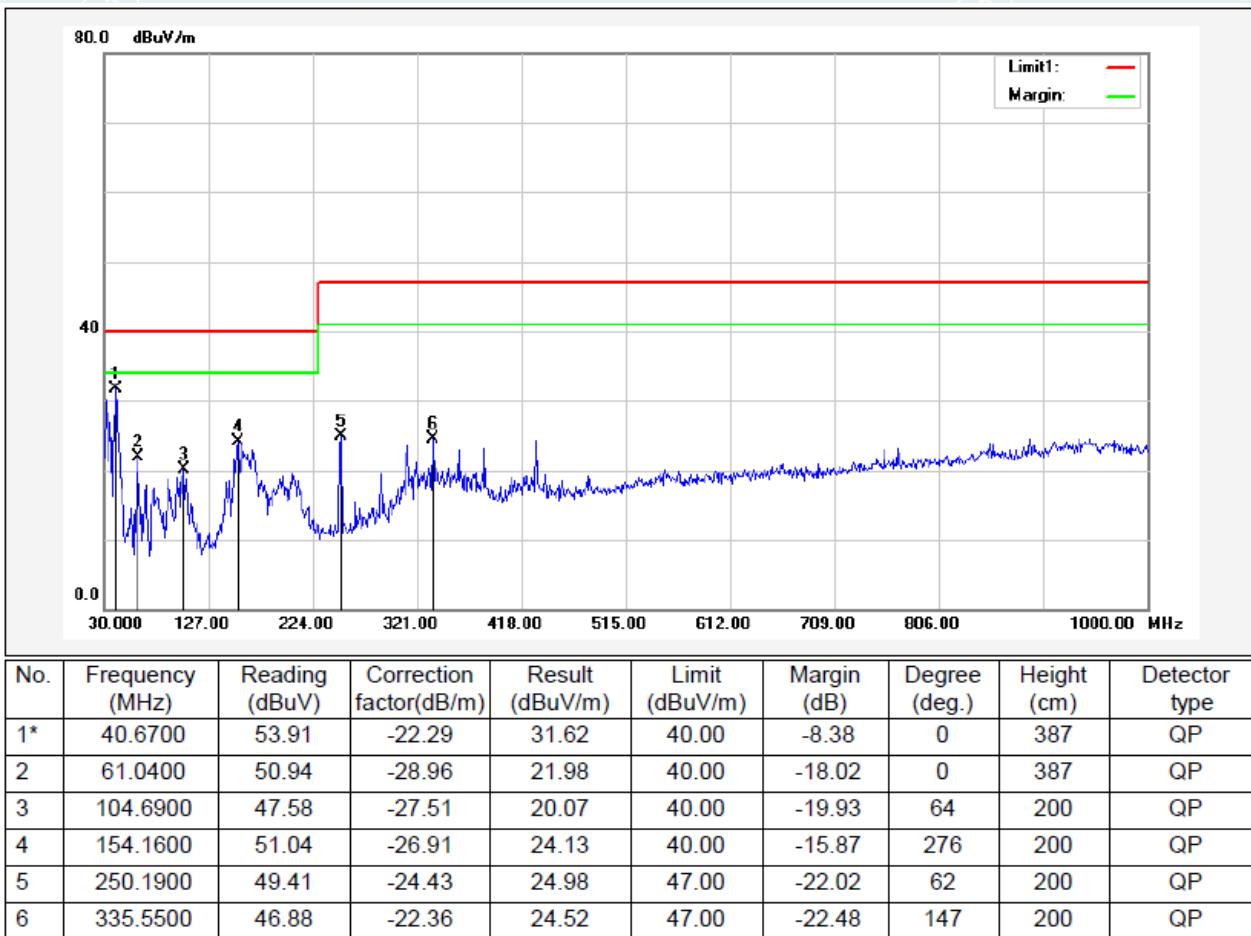
Polarity: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Detector type
1*	50.3700	49.86	-26.45	23.41	40.00	-16.59	360	289	QP
2	165.8000	43.23	-27.38	15.85	40.00	-24.15	21	200	QP
3	318.0900	50.94	-22.86	28.08	47.00	-18.92	0	122	QP
4	384.0500	41.42	-20.41	21.01	47.00	-25.99	158	100	QP
5	747.8000	39.00	-14.14	24.86	47.00	-22.14	233	100	QP
6	810.8500	39.05	-13.58	25.47	47.00	-21.53	223	100	QP

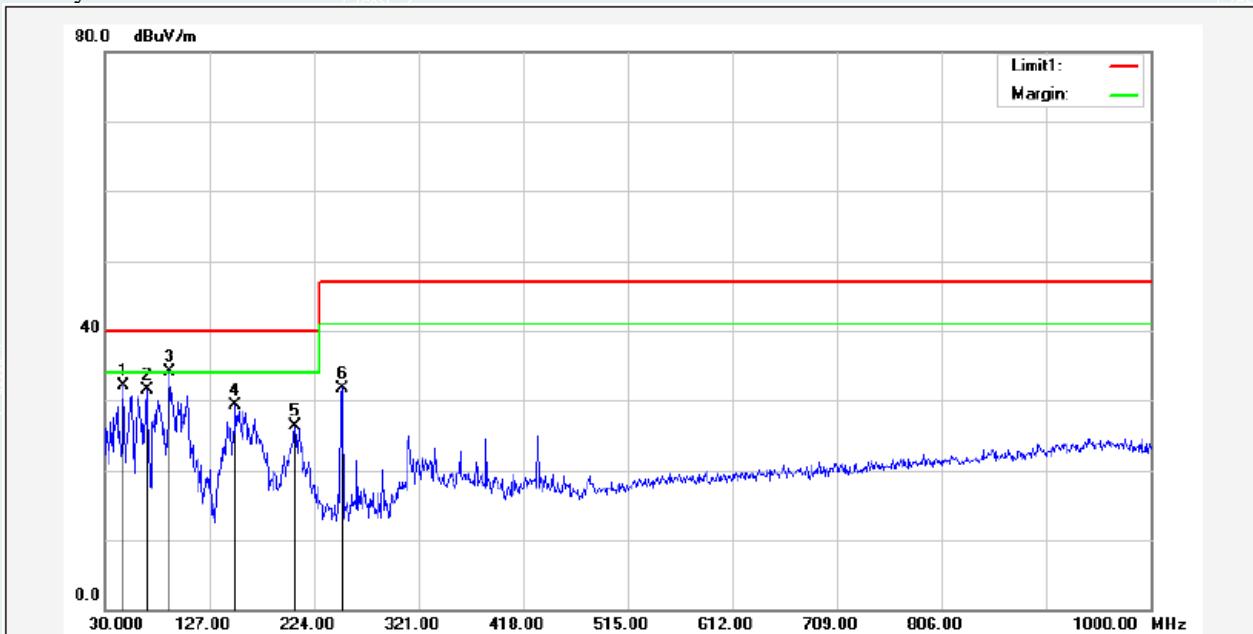
EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	22.6°C/51%RH/101.0kPa	Test Mode	Mode 2
Power supply	AC 230V/50Hz	Tested By	Yin Xiaogang
Test Date	2023-12-01	Sample No.	E20230331478001-0005

Polarity: Horizontal



EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	22.6 °C/51%RH/101.0kPa	Test Mode	Mode 2
Power supply	AC 230V/50Hz	Tested By	Yin Xiaogang
Test Date	2023-12-01	Sample No.	E20230331478001-0005

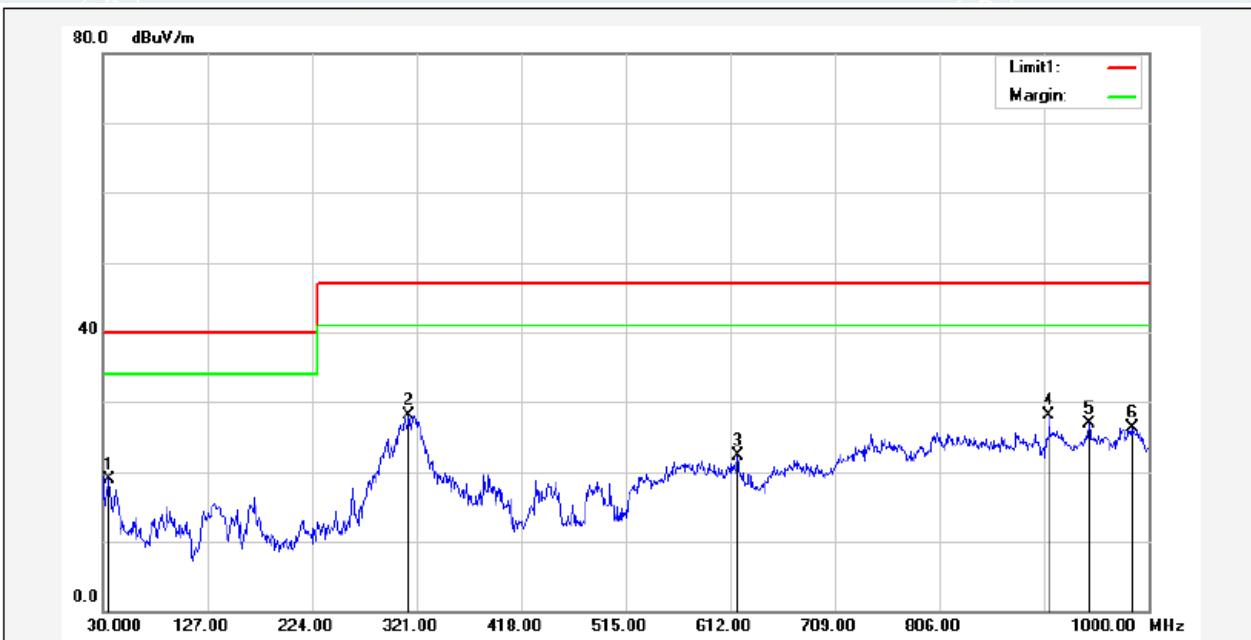
Polarity: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Detector type
1	47.4600	57.42	-25.25	32.17	40.00	-7.83	299	100	QP
2	68.8000	61.54	-30.07	31.47	40.00	-8.53	360	201	QP
3*	90.1400	64.64	-30.58	34.06	40.00	-5.94	45	100	QP
4	151.2500	55.95	-26.71	29.24	40.00	-10.76	318	100	QP
5	206.5400	52.33	-25.98	26.35	40.00	-13.65	314	100	QP
6	250.1900	56.23	-24.43	31.80	47.00	-15.20	314	100	QP

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	22.6°C/51%RH/101.0kPa	Test Mode	Mode 3
Power supply	AC 230V/50Hz	Tested By	Yin Xiaogang
Test Date	2023-12-01	Sample No.	E20230331478001-0005

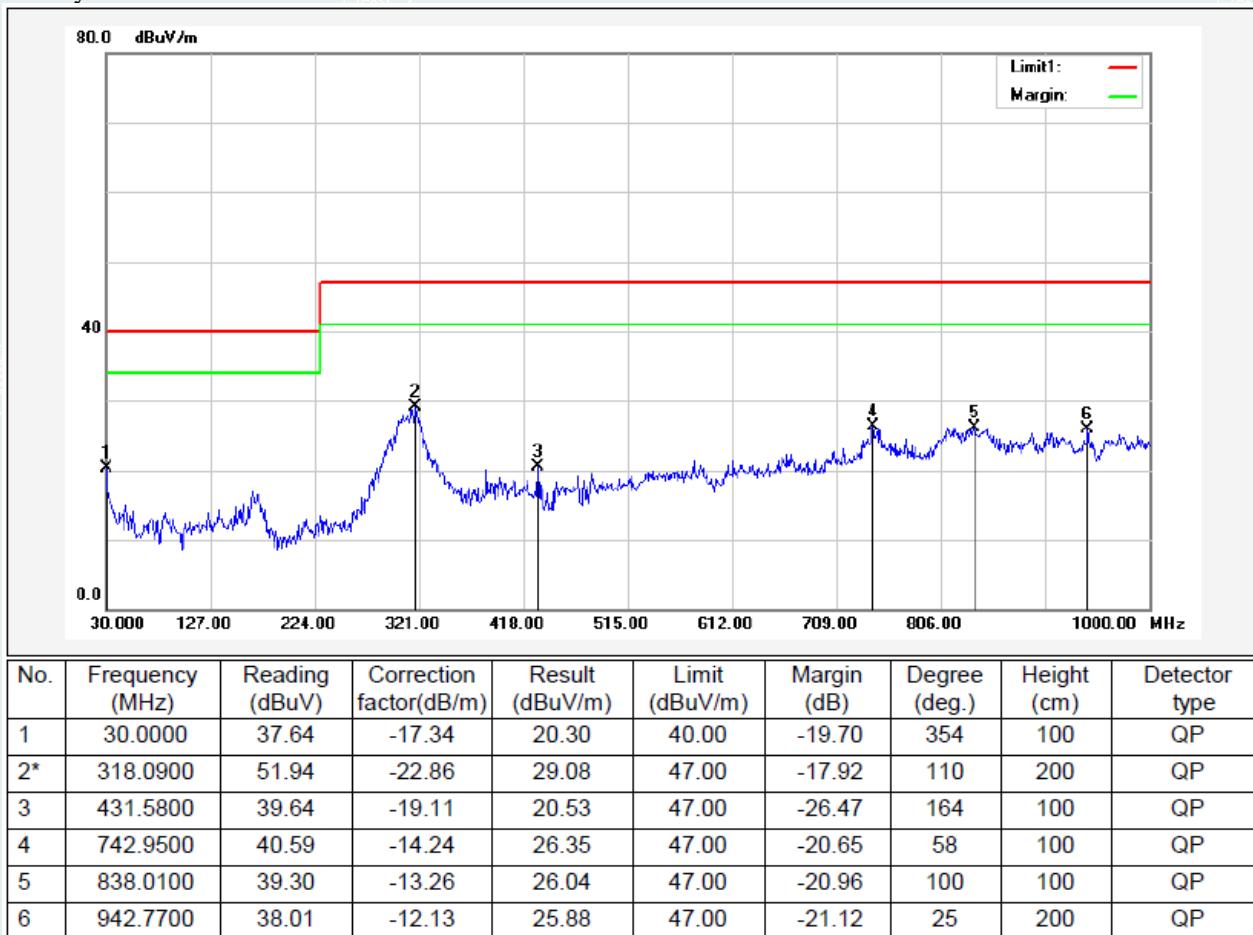
Polarity: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correction factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (deg.)	Height (cm)	Detector type
1	35.8200	39.00	-20.04	18.96	40.00	-21.04	20	100	QP
2*	314.2100	51.15	-22.98	28.17	47.00	-18.83	0	200	QP
3	618.7900	38.07	-15.77	22.30	47.00	-24.70	268	100	QP
4	907.8500	40.70	-12.62	28.08	47.00	-18.92	114	100	QP
5	944.7100	39.03	-12.10	26.93	47.00	-20.07	158	200	QP
6	984.4800	38.09	-11.78	26.31	47.00	-20.69	203	100	QP

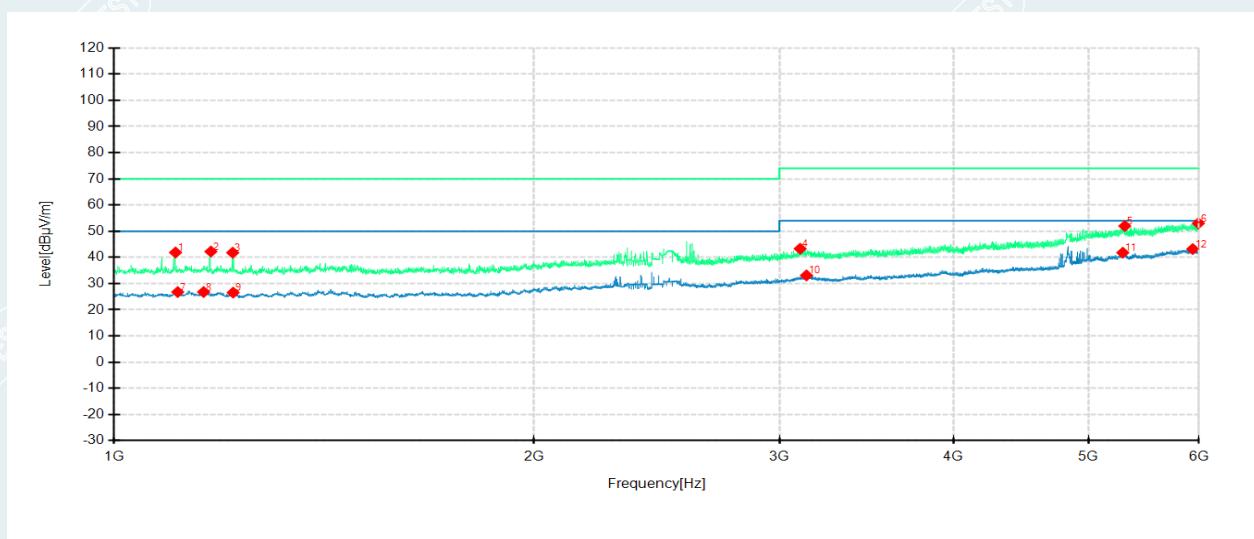
EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	22.6 °C/51%RH/101.0kPa	Test Mode	Mode 3
Power supply	AC 230V/50Hz	Tested By	Yin Xiaogang
Test Date	2023-12-01	Sample No.	E20230331478001-0005

Polarity: Vertical



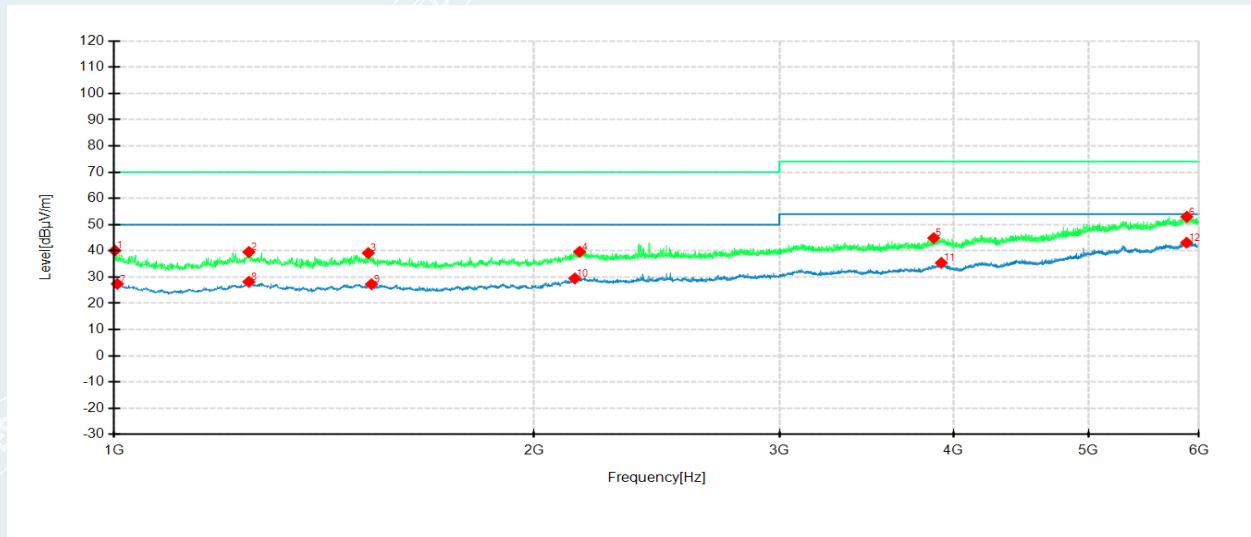
Above 1GHz

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	23.5°C/47%RH/101.0kPa	Test Mode	Mode 1
Power supply	AC 230V/50Hz	Tested By	Tang Shenghui
Test Date	2023-12-01	Sample No.	E20230331478001-0005

**Suspected Data List**

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1106.5000	62.78	41.88	-20.90	70.00	28.12	200	322	Horizontal
2	1173.0000	62.78	42.24	-20.54	70.00	27.76	200	322	Horizontal
3	1216.0000	62.64	41.82	-20.82	70.00	28.18	200	322	Horizontal
4	3105.0000	55.96	43.31	-12.65	74.00	30.69	100	77	Horizontal
5	5308.0000	54.37	52.00	-2.37	74.00	22.00	200	19	Horizontal
6	5994.0000	55.79	53.02	-2.77	74.00	20.98	100	321	Horizontal
7	1110.5000	47.63	26.78	-20.85	50.00	23.22	200	191	Horizontal
8	1159.0000	47.19	26.78	-20.41	50.00	23.22	100	341	Horizontal
9	1217.0000	47.37	26.55	-20.82	50.00	23.45	200	19	Horizontal
10	3137.5000	45.42	33.13	-12.29	54.00	20.87	100	153	Horizontal
11	5290.5000	44.17	41.81	-2.36	54.00	12.19	100	171	Horizontal
12	5938.5000	45.46	43.19	-2.27	54.00	10.81	200	304	Horizontal

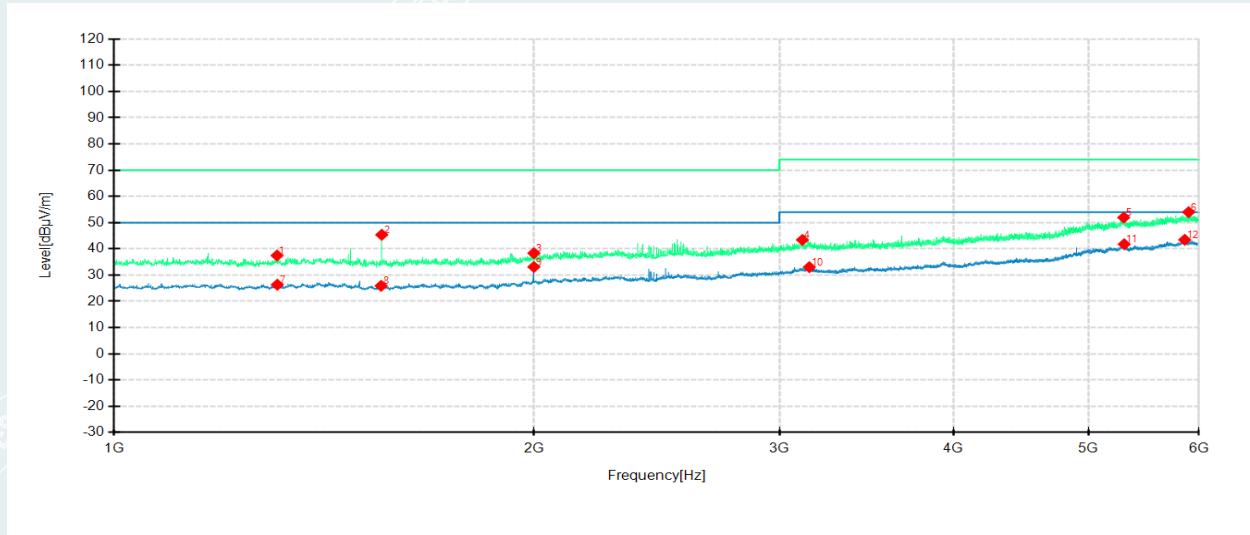
EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	23.5°C/47%RH/101.0kPa	Test Mode	Mode 1
Power supply	AC 230V/50Hz	Tested By	Tang Shenghui
Test Date	2023-12-01	Sample No.	E20230331478001-0005



Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1001.0000	59.82	40.12	-19.70	70.00	29.88	100	94	Vertical
2	1249.0000	58.65	39.56	-19.09	70.00	30.44	100	19	Vertical
3	1521.5000	58.60	39.17	-19.43	70.00	30.83	100	78	Vertical
4	2157.0000	55.77	39.66	-16.11	70.00	30.34	100	360	Vertical
5	3871.5000	54.91	44.89	-10.02	74.00	29.11	100	243	Vertical
6	5880.5000	55.48	52.99	-2.49	74.00	21.01	200	192	Vertical
7	1005.0000	47.25	27.40	-19.85	50.00	22.60	200	156	Vertical
8	1249.0000	47.29	28.20	-19.09	50.00	21.80	200	156	Vertical
9	1529.5000	46.74	27.28	-19.46	50.00	22.72	200	156	Vertical
10	2140.0000	45.82	29.48	-16.34	50.00	20.52	200	192	Vertical
11	3920.5000	44.98	35.42	-9.56	54.00	18.58	200	7	Vertical
12	5879.0000	45.59	43.13	-2.46	54.00	10.87	200	285	Vertical

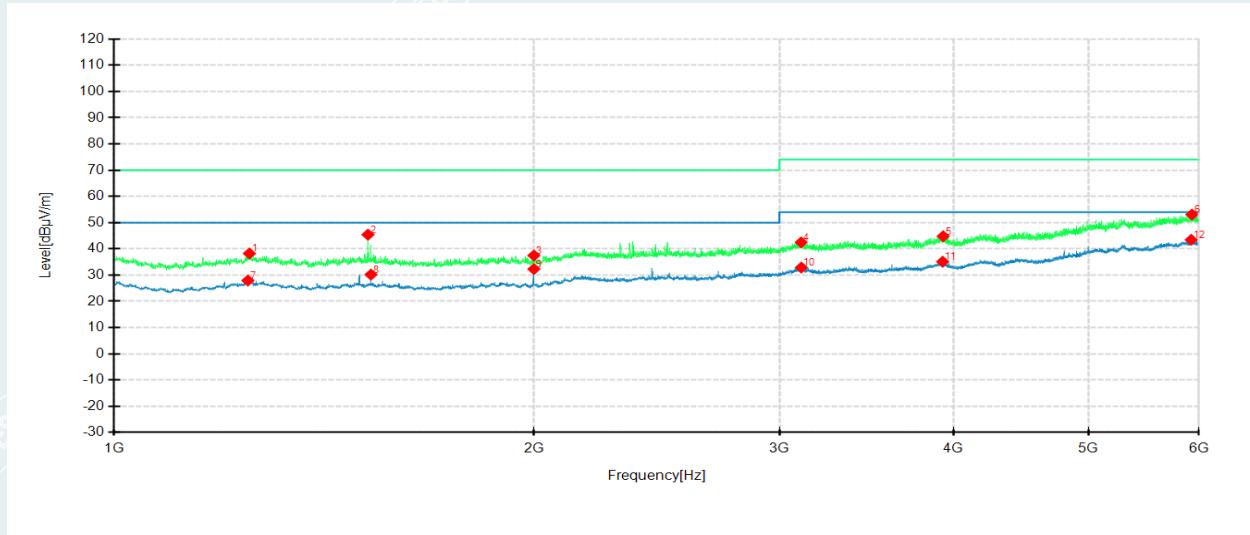
EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	23.5°C/47%RH/101.0kPa	Test Mode	Mode 2
Power supply	AC 230V/50Hz	Tested By	Tang Shenghui
Test Date	2023-12-01	Sample No.	E20230331478001-0005



Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1308.5000	57.94	37.48	-20.46	70.00	32.52	200	222	Horizontal
2	1555.5000	65.88	45.38	-20.50	70.00	24.62	200	205	Horizontal
3	2000.0000	56.35	38.36	-17.99	70.00	31.64	200	259	Horizontal
4	3116.5000	55.94	43.42	-12.52	74.00	30.58	200	259	Horizontal
5	5299.0000	54.05	51.95	-2.10	74.00	22.05	200	241	Horizontal
6	5898.5000	56.66	54.00	-2.66	74.00	20.00	200	76	Horizontal
7	1309.0000	46.80	26.34	-20.46	50.00	23.66	100	136	Horizontal
8	1554.0000	46.41	25.90	-20.51	50.00	24.10	200	19	Horizontal
9	2000.0000	51.11	33.12	-17.99	50.00	16.88	100	266	Horizontal
10	3152.5000	45.23	33.03	-12.20	54.00	20.97	100	100	Horizontal
11	5303.0000	43.96	41.78	-2.18	54.00	12.22	200	360	Horizontal
12	5860.5000	45.38	43.46	-1.92	54.00	10.54	200	279	Horizontal

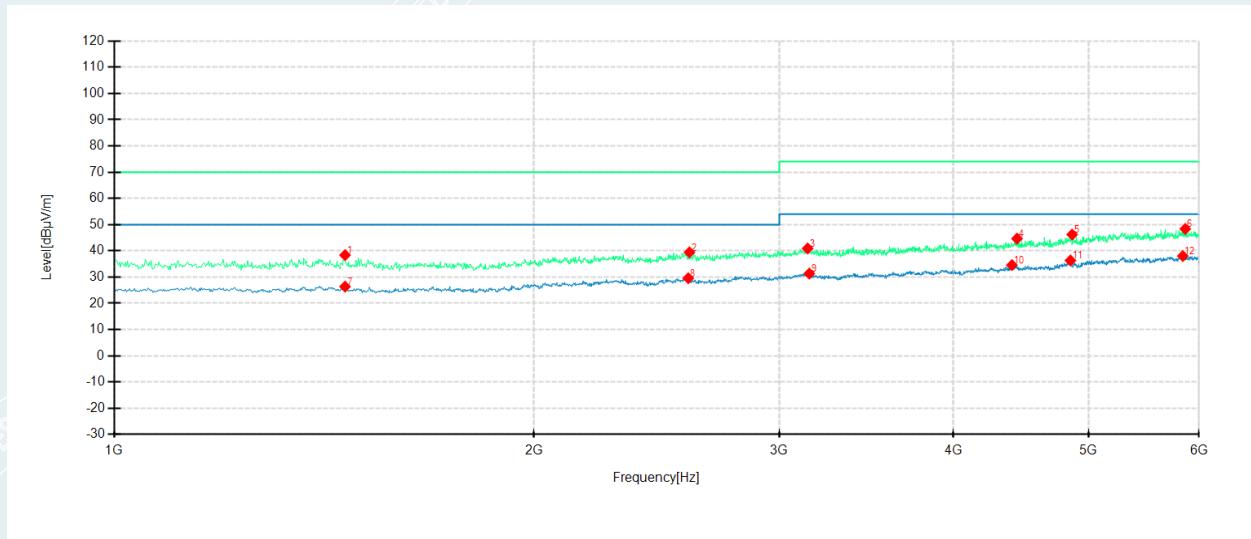
EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	23.5°C/47%RH/101.0kPa	Test Mode	Mode 2
Power supply	AC 230V/50Hz	Tested By	Tang Shenghui
Test Date	2023-12-01	Sample No.	E20230331478001-0005



Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1250.0000	57.29	38.24	-19.05	70.00	31.76	100	280	Vertical
2	1520.5000	64.84	45.42	-19.42	70.00	24.58	100	206	Vertical
3	2000.0000	56.79	37.50	-19.29	70.00	32.50	100	280	Vertical
4	3110.0000	55.01	42.48	-12.53	74.00	31.52	200	302	Vertical
5	3932.5000	54.36	44.81	-9.55	74.00	29.19	200	63	Vertical
6	5930.5000	55.49	53.10	-2.39	74.00	20.90	200	322	Vertical
7	1247.0000	47.10	27.95	-19.15	50.00	22.05	200	174	Vertical
8	1528.0000	49.64	30.19	-19.45	50.00	19.81	100	206	Vertical
9	2000.0000	51.60	32.31	-19.29	50.00	17.69	100	280	Vertical
10	3111.0000	45.42	32.89	-12.53	54.00	21.11	100	355	Vertical
11	3929.5000	44.66	35.11	-9.55	54.00	18.89	100	131	Vertical
12	5923.5000	45.94	43.46	-2.48	54.00	10.54	200	174	Vertical

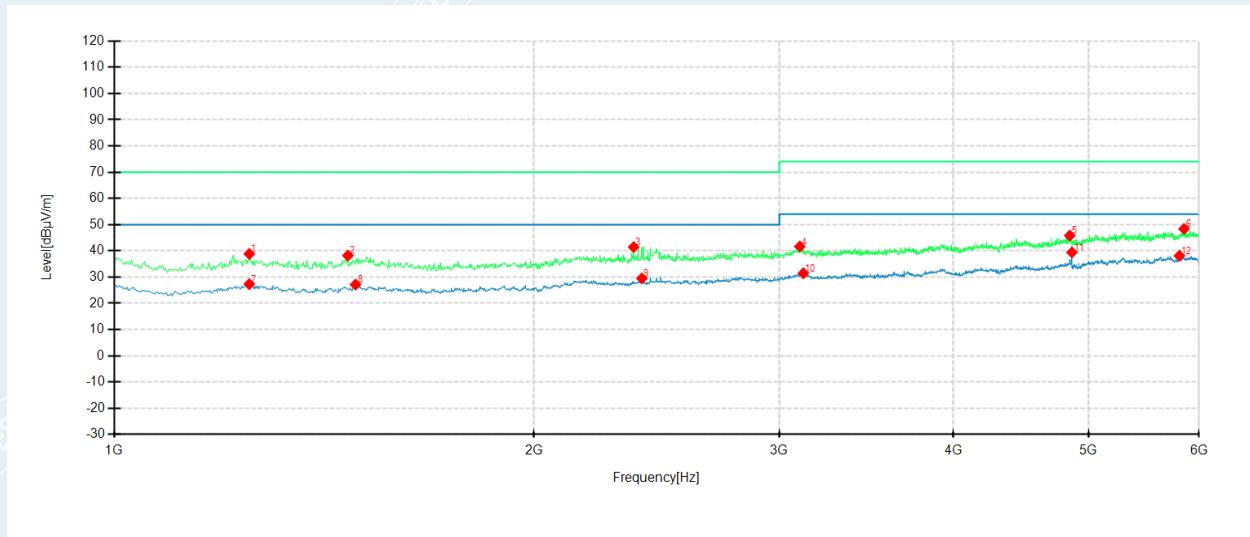
EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	23.5°C/47%RH/101.0kPa	Test Mode	Mode 3
Power supply	AC 230V/50Hz	Tested By	Tang Shenghui
Test Date	2023-12-01	Sample No.	E20230331478001-0005



Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1464.1000	58.27	38.38	-19.89	70.00	31.62	200	39	Horizontal
2	2586.1000	54.96	39.44	-15.52	70.00	30.56	100	4	Horizontal
3	3143.7000	53.13	40.91	-12.22	74.00	33.09	100	4	Horizontal
4	4442.5000	52.77	44.67	-8.10	74.00	29.33	100	150	Horizontal
5	4865.8000	51.55	46.22	-5.33	74.00	27.78	100	284	Horizontal
6	5865.4000	50.38	48.37	-2.01	74.00	25.63	200	18	Horizontal
7	1464.1000	46.26	26.37	-19.89	50.00	23.63	200	358	Horizontal
8	2581.0000	45.06	29.57	-15.49	50.00	20.43	200	18	Horizontal
9	3152.2000	43.54	31.34	-12.20	54.00	22.66	100	263	Horizontal
10	4405.1000	42.78	34.58	-8.20	54.00	19.42	200	18	Horizontal
11	4852.2000	41.68	36.34	-5.34	54.00	17.66	200	154	Horizontal
12	5841.6000	39.95	38.04	-1.91	54.00	15.96	100	114	Horizontal

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	23.5°C/47%RH/101.0kPa	Test Mode	Mode 3
Power supply	AC 230V/50Hz	Tested By	Tang Shenghui
Test Date	2023-12-01	Sample No.	E20230331478001-0005



Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV/m]	Level [dBμV/m]	Factor [dB]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1249.9000	57.90	38.85	-19.05	70.00	31.15	100	20	Vertical
2	1470.9000	57.97	38.20	-19.77	70.00	31.80	100	20	Vertical
3	2358.3000	58.01	41.43	-16.58	70.00	28.57	100	330	Vertical
4	3102.9000	54.16	41.65	-12.51	74.00	32.35	100	193	Vertical
5	4847.1000	51.48	45.82	-5.66	74.00	28.18	200	225	Vertical
6	5853.5000	50.45	48.38	-2.07	74.00	25.62	100	20	Vertical
7	1249.9000	46.38	27.33	-19.05	50.00	22.67	100	20	Vertical
8	1489.6000	46.67	27.16	-19.51	50.00	22.84	200	320	Vertical
9	2390.6000	45.62	29.51	-16.11	50.00	20.49	100	174	Vertical
10	3121.6000	44.03	31.47	-12.56	54.00	22.53	100	292	Vertical
11	4864.1000	45.11	39.43	-5.68	54.00	14.57	200	225	Vertical
12	5809.3000	41.19	38.14	-3.05	54.00	15.86	100	310	Vertical

6.2 CONDUCTED EMISSION MEASUREMENT (CE)

Test Requirement: ETSI EN 301 489-1
 ETSI EN 301 489-3
 ETSI EN 301 489-17
 EN 55032

Test Method: EN 55032

6.2.1. LIMITS

Frequency (MHz)	Quasi-peak (dB μ V)	Average (dB μ V)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

NOTE: (1) The lower limit shall apply at the transition frequencies.

(2) The limit decreases in line with the logarithm of the frequency in the range of 0.15~0.5MHz.

6.2.2. TEST PROCEDURES

The test method shall be in accordance with CENELEC EN 55032 [1] annex A.3 and the Artificial Mains Networks (AMNs) shall be connected to the AC mains power source.

The measurement frequency range extends from 150 kHz to 30 MHz. When the EUT is a transmitter operating at frequencies below 30 MHz, then the exclusion band for transmitters applies for measurements in the transmit mode of operation.

(1) Procedure of Preliminary Test

For measurement of the disturbance voltage the equipment under test (EUT) is connected to the power supply mains and any other extended network via one or more artificial network(s). A EUT, whether intended to be grounded or not, and which is to be used on a table is configured as follows:

--Either the bottom or the rear of the EUT shall be at a controlled distance of 40 cm from a reference ground plane. This ground plane is normally the wall or floor of a shielded room. It may also be a grounded metal plane of at least 2m by 2m. This is physically accomplished as follows:

- 1) Place the EUT on a table of non-conducting material which is at least 80 cm high. Place the EUT so that it is 40 cm from the wall of the shielded room, or
- 2) Place the EUT on a table of non-conducting material which is 40 cm high so that the bottom of the EUT is 40 cm above the ground plane.

-- All other conductive surfaces of the EUT shall be at least 80 cm from the reference ground plane.

-- The AANs are placed on the floor that one side of the AAN housings is 40 cm from the vertical reference ground plane and other metallic parts.

-- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth forming a bundle 30 cm to 40 cm long, hanging approximately in the middle between the ground plane and the table.

-- I/O cables that are connected to a peripheral shall be bundled in the centre. The end of the cable may be terminated if required using correct terminating impedance. The total length shall not exceed 1 m.

The test mode(s) were scanned during the preliminary test. After the preliminary scan, we found the test mode producing the highest emission level. The EUT configuration and cable configuration of the above highest

emission levels were recorded for reference of the final test.

(2) Procedure of Final Test

EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test. A scan was taken on both power lines, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.

6.2.3. TEST SETUP

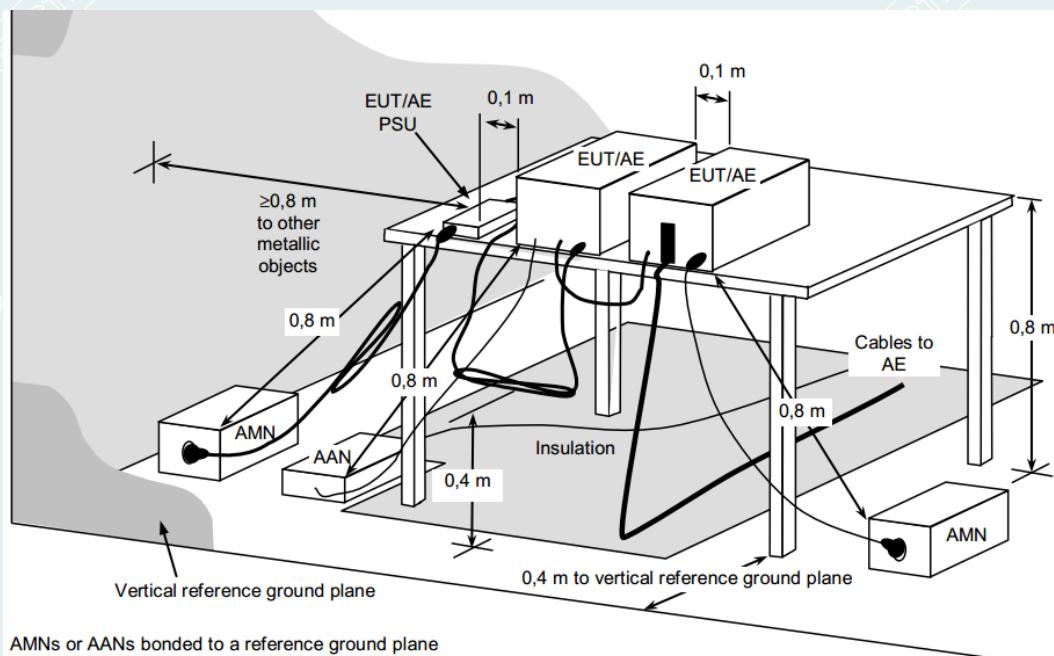


Figure 7.2-1: Test arrangement for Conducted emission measurement

6.2.4. DATE SAMPLE

Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPeak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)
X.XXXX	32.69	25.65	11.52	44.21	37.17	65.78	55.79	-21.57	-18.62

Correction factor = Insertion loss of LISN + Cable Loss
 Result = QuasiPeak Reading/ Average Reading + Correction factor
 Limit = Limit stated in standard
 Margin = Result (dBuV) – Limit (dBuV)

6.2.5. PHOTOGRAPH OF THE TEST ARRANGEMENT

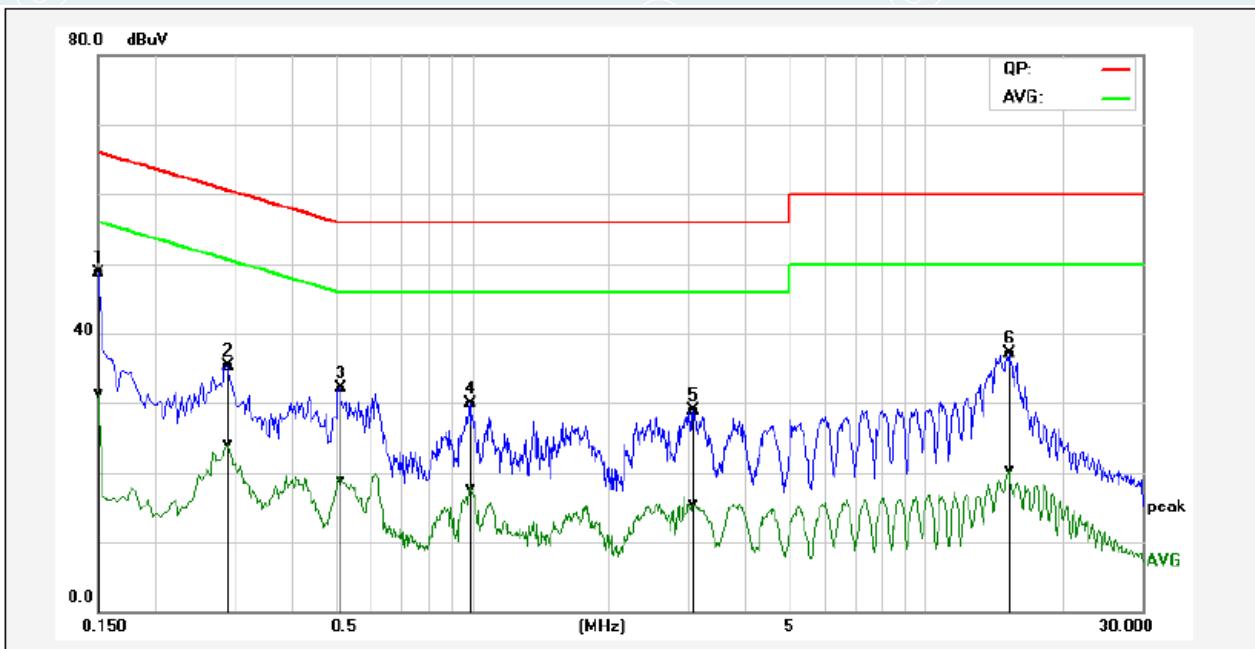
Please refer to the attached document E20230331478001-28 CE-Test Photo.

6.2.6. TEST RESULTS

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	21.7°C/49%RH/101kPa	Test Mode	Mode 1
Power supply	AC 230V/50Hz	Tested By	Chen Zixin
Test Date	2023-11-29	Sample No.	E20230331478001-0005

(The chart below shows the highest readings taken from the final data.)

Line: L1

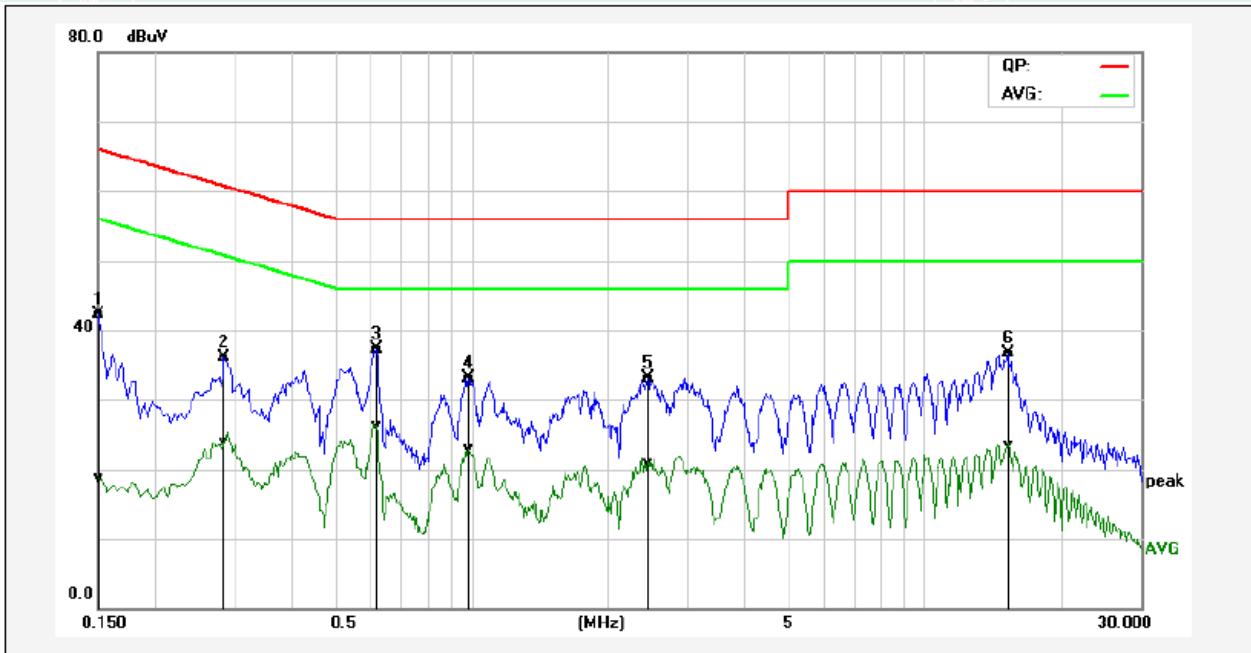


No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1*	0.1500	38.97	21.56	9.75	48.72	31.31	65.99	56.00	-17.27	-24.69	Pass
2	0.2900	25.62	14.52	9.68	35.30	24.20	60.52	50.52	-25.22	-26.32	Pass
3	0.5140	22.38	9.08	9.69	32.07	18.77	56.00	46.00	-23.93	-27.23	Pass
4	0.9940	20.18	8.09	9.71	29.89	17.80	56.00	46.00	-26.11	-28.20	Pass
5	3.0780	18.91	5.53	10.01	28.92	15.54	56.00	46.00	-27.08	-30.46	Pass
6	15.2460	27.21	10.47	9.91	37.12	20.38	60.00	50.00	-22.88	-29.62	Pass

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	21.7°C/49%RH/101kPa	Test Mode	Mode 1
Power supply	AC 230V/50Hz	Tested By	Chen Zexin
Test Date	2023-11-29	Sample No.	E20230331478001-0005

(The chart below shows the highest readings taken from the final data.)

Line: N

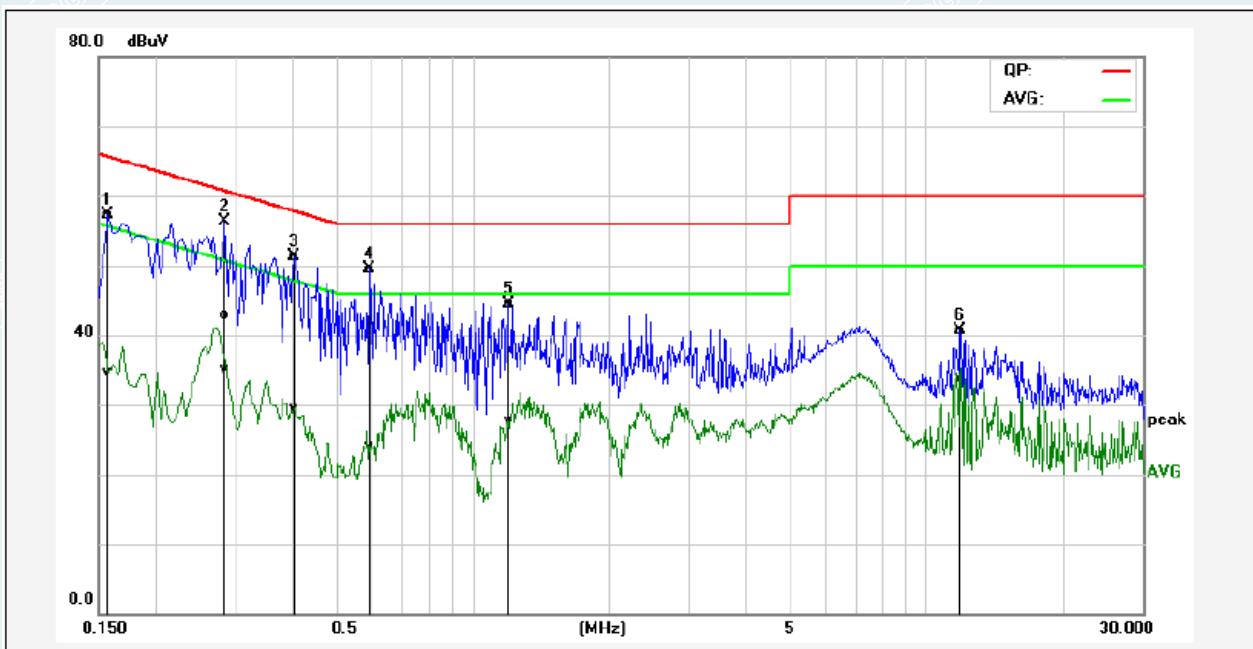


No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.1500	32.57	8.99	9.70	42.27	18.69	65.99	56.00	-23.72	-37.31	Pass
2	0.2860	26.52	14.24	9.68	36.20	23.92	60.64	50.64	-24.44	-26.72	Pass
3*	0.6180	27.53	16.55	9.68	37.21	26.23	56.00	46.00	-18.79	-19.77	Pass
4	0.9860	23.44	13.20	9.70	33.14	22.90	56.00	46.00	-22.86	-23.10	Pass
5	2.4539	23.28	11.18	9.82	33.10	21.00	56.00	46.00	-22.90	-25.00	Pass
6	15.2700	26.65	13.38	10.06	36.71	23.44	60.00	50.00	-23.29	-26.56	Pass

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	21.7°C/49%RH/101kPa	Test Mode	Mode 2
Power supply	AC 230V/50Hz	Tested By	Chen Zexin
Test Date	2023-11-29	Sample No.	E20230331478001-0005

(The chart below shows the highest readings taken from the final data.)

Line: L1

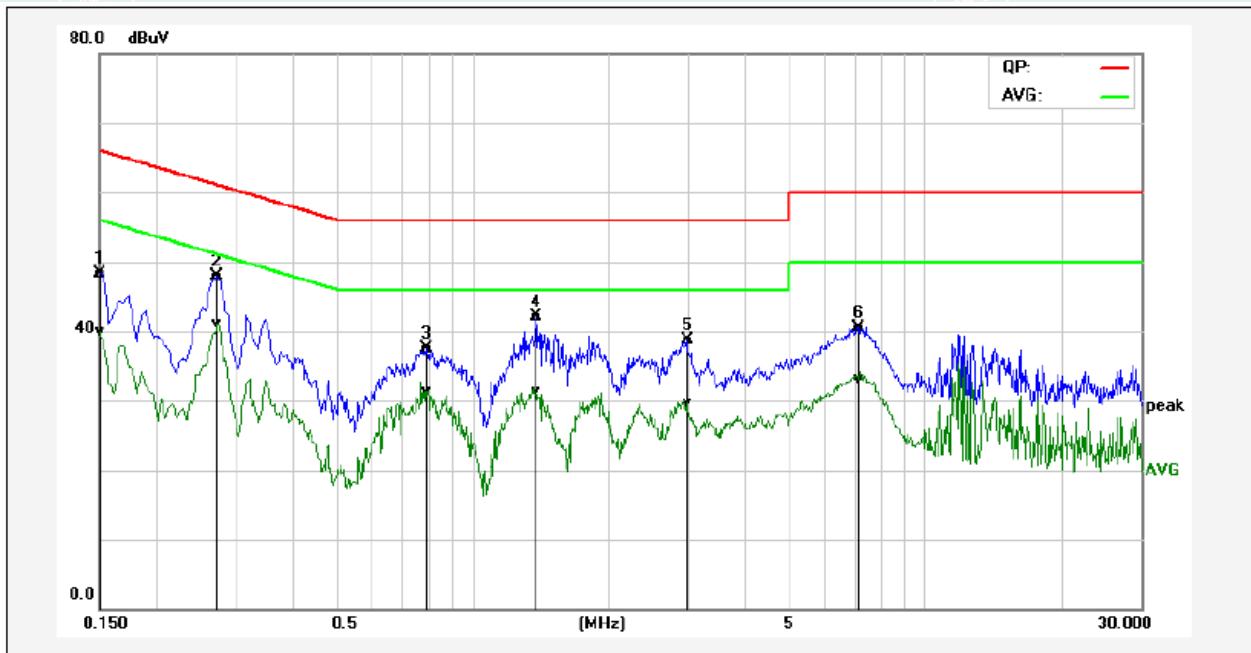


No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.1580	47.52	25.08	9.72	57.24	34.80	65.56	55.57	-8.32	-20.77	Pass
2	0.2860	33.32	25.42	9.68	43.00	35.10	60.64	50.64	-17.64	-15.54	Pass
3	0.4060	41.60	19.86	9.69	51.29	29.55	57.73	47.73	-6.44	-18.18	Pass
4*	0.5940	39.88	14.40	9.71	49.59	24.11	56.00	46.00	-6.41	-21.89	Pass
5	1.1980	34.86	18.03	9.71	44.57	27.74	56.00	46.00	-11.43	-18.26	Pass
6	11.8940	30.78	24.00	9.87	40.65	33.87	60.00	50.00	-19.35	-16.13	Pass

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	21.7°C/49%RH/101kPa	Test Mode	Mode 2
Power supply	AC 230V/50Hz	Tested By	Chen Zexin
Test Date	2023-11-29	Sample No.	E20230331478001-0005

(The chart below shows the highest readings taken from the final data.)

Line: N

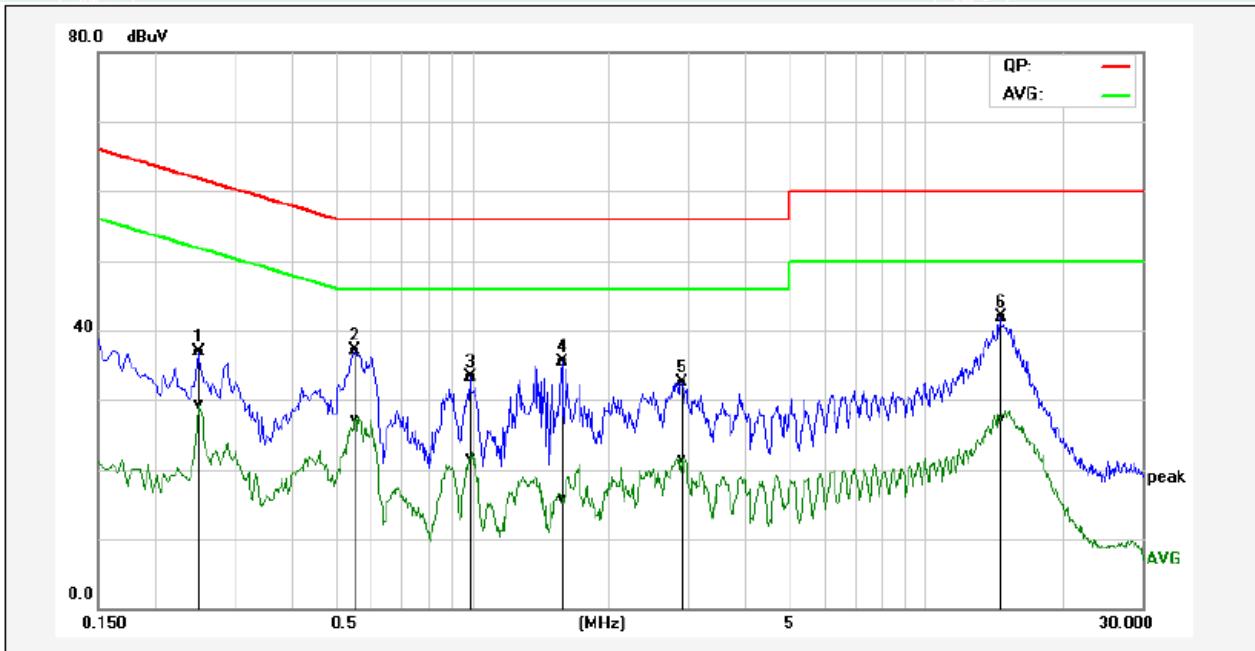


No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.1500	38.68	30.24	9.70	48.38	39.94	65.99	56.00	-17.61	-16.06	Pass
2*	0.2740	38.29	31.53	9.67	47.96	41.20	60.99	51.00	-13.03	-9.80	Pass
3	0.7940	27.85	21.71	9.69	37.54	31.40	56.00	46.00	-18.46	-14.60	Pass
4	1.3820	32.32	21.51	9.73	42.05	31.24	56.00	46.00	-13.95	-14.76	Pass
5	2.9820	28.79	19.70	9.98	38.77	29.68	56.00	46.00	-17.23	-16.32	Pass
6	7.1380	30.63	23.38	9.82	40.45	33.20	60.00	50.00	-19.55	-16.80	Pass

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	21.7°C/49%RH/101kPa	Test Mode	Mode 3
Power supply	AC 230V/50Hz	Tested By	Chen Zexin
Test Date	2023-11-29	Sample No.	E20230331478001-0005

(The chart below shows the highest readings taken from the final data.)

Line: L1

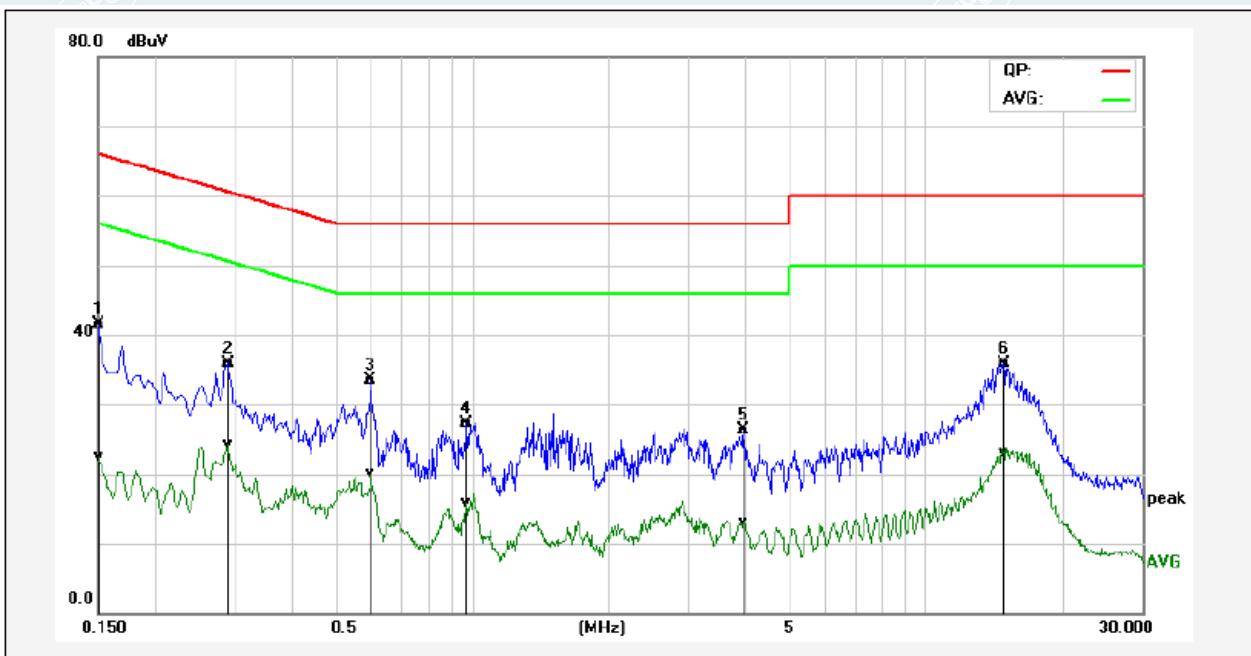


No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.2500	27.23	19.72	9.67	36.90	29.39	61.75	51.76	-24.85	-22.37	Pass
2	0.5540	27.49	17.38	9.68	37.17	27.06	56.00	46.00	-18.83	-18.94	Pass
3	0.9940	23.54	12.02	9.70	33.24	21.72	56.00	46.00	-22.76	-24.28	Pass
4	1.5780	25.75	5.99	9.75	35.50	15.74	56.00	46.00	-20.50	-30.26	Pass
5	2.9060	22.48	11.62	9.96	32.44	21.58	56.00	46.00	-23.56	-24.42	Pass
6*	14.6620	31.83	16.98	10.04	41.87	27.02	60.00	50.00	-18.13	-22.98	Pass

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	21.7°C/49%RH/101kPa	Test Mode	Mode 3
Power supply	AC 230V/50Hz	Tested By	Chen Zexin
Test Date	2023-11-29	Sample No.	E20230331478001-0005

(The chart below shows the highest readings taken from the final data.)

Line: N



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.1500	31.81	12.70	9.75	41.56	22.45	65.99	56.00	-24.43	-33.55	Pass
2	0.2900	26.20	14.64	9.68	35.88	24.32	60.52	50.52	-24.64	-26.20	Pass
3*	0.5980	23.87	10.36	9.71	33.58	20.07	56.00	46.00	-22.42	-25.93	Pass
4	0.9780	17.59	6.27	9.71	27.30	15.98	56.00	46.00	-28.70	-30.02	Pass
5	3.9740	16.51	3.37	9.75	26.26	13.12	56.00	46.00	-29.74	-32.88	Pass
6	14.8820	26.03	13.21	9.90	35.93	23.11	60.00	50.00	-24.07	-26.89	Pass

6.3 ASYMMETRIC MODE CONDUCTED EMISSION

Test Requirement: ETSI EN 301 489-1
 ETSI EN 301 489-3
 ETSI EN 301 489-17
 EN 55032

Test Method: EN 55032

6.3.1. LIMITS

Table 6.1 - Requirements for asymmetric mode conducted emissions from Class B equipment

Frequency range (MHz)	Coupling device	Detector type / bandwidth	Class B Limits (dB μ V)
0.15 - 0.5	AAN	Quasi Peak / 9 kHz	84 - 74
0.5 - 30			74
0.15 - 0.5	AAN	Average / 9 kHz	74 - 64
0.5 - 30			64
0.15 - 0.5	Current Probe	Quasi Peak / 9 kHz	40 - 30
0.5 - 30			30
0.15 - 0.5	Current Probe	Average / 9 kHz	30 - 20
0.5 - 30			20

The test shall cover the entire frequency range.

Table 6.2 - Requirements for asymmetric mode conducted emissions from Class A equipment

Frequency range (MHz)	Coupling device	Detector type / bandwidth	Class A Limits (dB μ V)
0.15 - 0.5	AAN	Quasi Peak / 9 kHz	97 - 87
0.5 - 30			87
0.15 - 0.5	AAN	Average / 9 kHz	84 - 74
0.5 - 30			74
0.15 - 0.5	Current Probe	Quasi Peak / 9 kHz	53 - 43
0.5 - 30			43
0.15 - 0.5	Current Probe	Average / 9 kHz	40 - 30
0.5 - 30			30

The test shall cover the entire frequency range.

6.3.2. TEST PROCEDURE

- a) Let the EUT work in test modes.
- b) Selecting AAN for Balanced unscreened cable or a current probe for Screened or Coaxial cable to take measurement.
- c) Receiver connected to the AAN or current probe. overall range scan by using the test receiver controlled by computer and recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.
- d) Measurement procedure using AAN: Spacing between AAN and EUT shall be 0.8 m.
- e) Measurement procedure using current probe:
 - The current probe to EUT horizontal distance may be increased to 0.8 m.
 - Horizontal spacing between EUT and current probe (or 150 Ω resistor) shall be 0.3m to 0.8m.
 - Spacing between current probe and 150 Ω resistor shall be 0.1 m.
 - Break the external protective insulation (exposing the shield) and connect a 150 Ω resistor with a physical connection between the cable screen and the RGP. The 150 Ω. resistor shall be ≤ 0.3 m from the outside surface of the screen to ground.
- f) The mains cable of the unit being assessed shall be connected to one AMN. All other units of the EUT and AE shall be connected to a second (or multiple) AMN(s). It is acceptable to connect these other equipments to an AMN via extension cables that include one or multiple socket outlets. Where additional socket outlets are needed, the extension shall be as short as practical. All AMNs shall be bonded to a RGP.
- g) For AMNs mounted below the RGP an extension cable may be used. The AMN specification shall be met at the connection point for the EUT (the end of the extension cable or power strip) with at least 0.8 m spacing between the EUT and the connection point on the extension cable.
- h) Cables connecting to AE located outside the measurement area shall drop directly to, but be insulated from, the RGP (or turntable where applicable), and then be routed directly to the place where they leave the test site. The thickness of the insulation shall not be more than 150 mm. However, cables which would normally be bonded to ground should be bonded to the RGP in accordance with normal practice or the manufacturer's recommendation.
- i) For table-top equipment
 - The RGP shall have a minimum size of 2 m by 2 m and shall extend a minimum of 0.5 m beyond the EUT, local AE and associated cabling in all directions.
 - The measurement shall be performed using a vertical RGP. The rear of the EUT, local AE and associated cabling shall be 0.4 m from the vertical RGP.
 - The portions of signal cables that hang over the rear of the table shall be positioned at a distance of 0.4 m from the vertical RGP and no less than 0.4 m from any horizontal RGP bonded to the vertical RGP. If necessary, maintain the separations using a fixture made of non-conductive material with an appropriate dielectric constant.
 - The equipment to be tested is placed in the test facility on a non-conductive table 0.8 m(± 0.01 m) high.
 - Spacing between any two elements on the measurement table shall be ≥ 0.1 m ($\pm 10\%$).
 - Equipment, including the power supply, intended for table-top use shall be placed on a nonconductive table of sufficient size to hold the EUT, local AE and associated cabling. Where practical, the rear of the EUT should be flush with the rear of the table.

Where possible, cables that connect between modules or units shall hang over the back of the table. If a cable hangs closer than 0.4 m from the horizontal RGP (or floor), the excess shall be folded at the cable centre into a bundle no longer than 0.4 m, such that the bundle is 0.4 m above the horizontal RGP.

j) For floor-standing equipment

The EUT shall be insulated (by insulation of maximum thickness of 150 mm) from the horizontal reference ground plane.

----- The following blanks -----

6.3.3. TEST SETUP

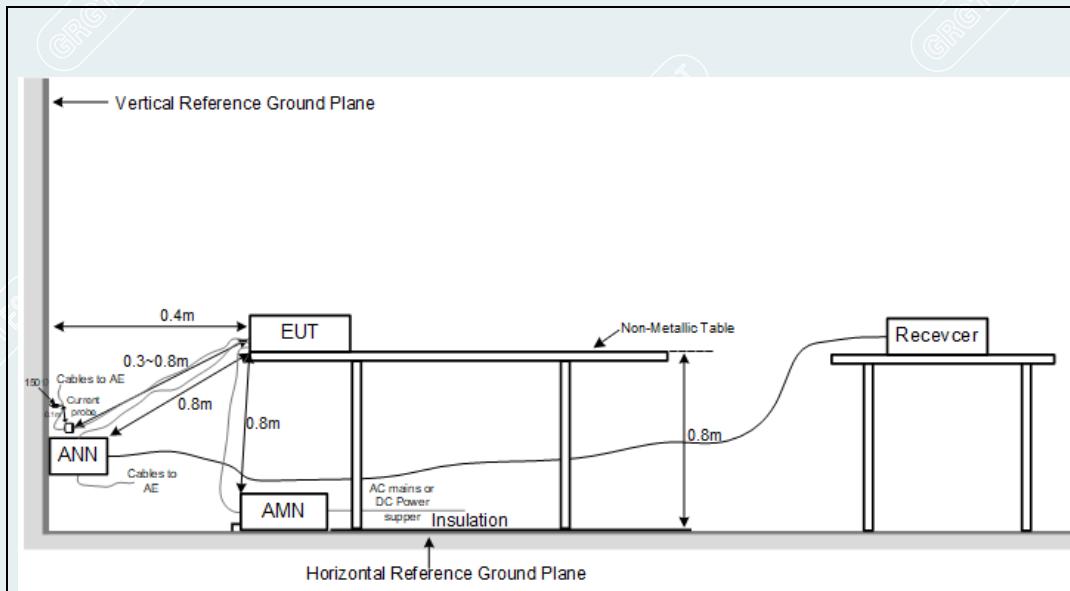


Figure 5.3 – Example measurement arrangement for table-top EUT

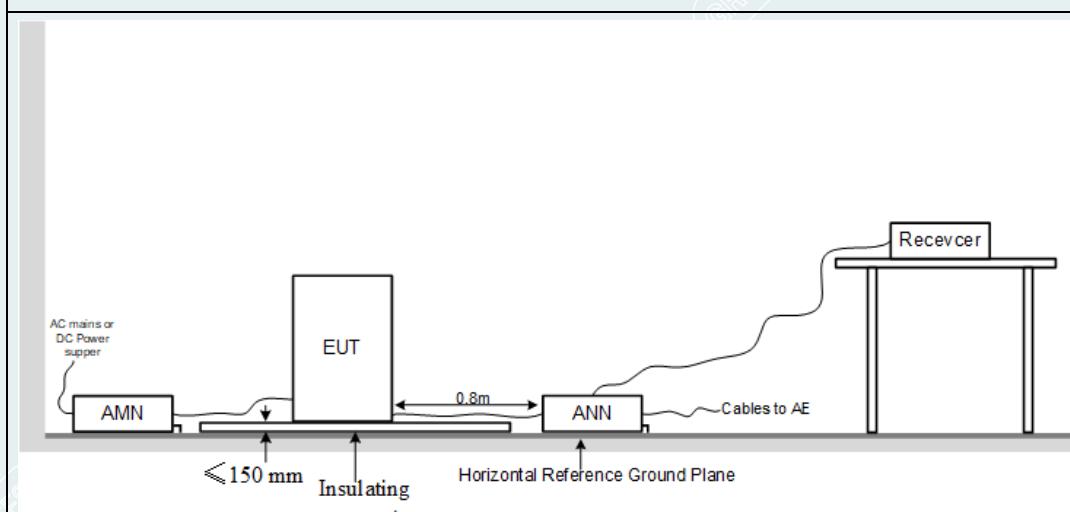


Figure 5.4 – Example measurement arrangement for floor standing EUT

6.3.4. DATA SAMPLE

Frequency (MHz)	QuasiPeak Reading (dBuV)	Average Reading (dBuV)	Correction Factor (dB)	QuasiPeak Result (dBuV)	Average Result (dBuV)	QuasiPe ak Limit (dBuV)	Average Limit (dBuV)	QuasiPeak Margin (dB)	Average Margin (dB)	Remark
X.XXXX	32.69	25.65	11.52	44.21	37.17	74.00	64.00	-29.79	-26.83	Pass

Factor = Insertion loss of ANN or current probe + Cable Loss

Result = Quasi-peak Reading/ Average Reading + Factor

Limit = Limit stated in standard

Margin = Result (dBuV) – Limit (dBuV)

6.3.5. PHOTOGRAPH OF THE TEST ARRANGEMENT

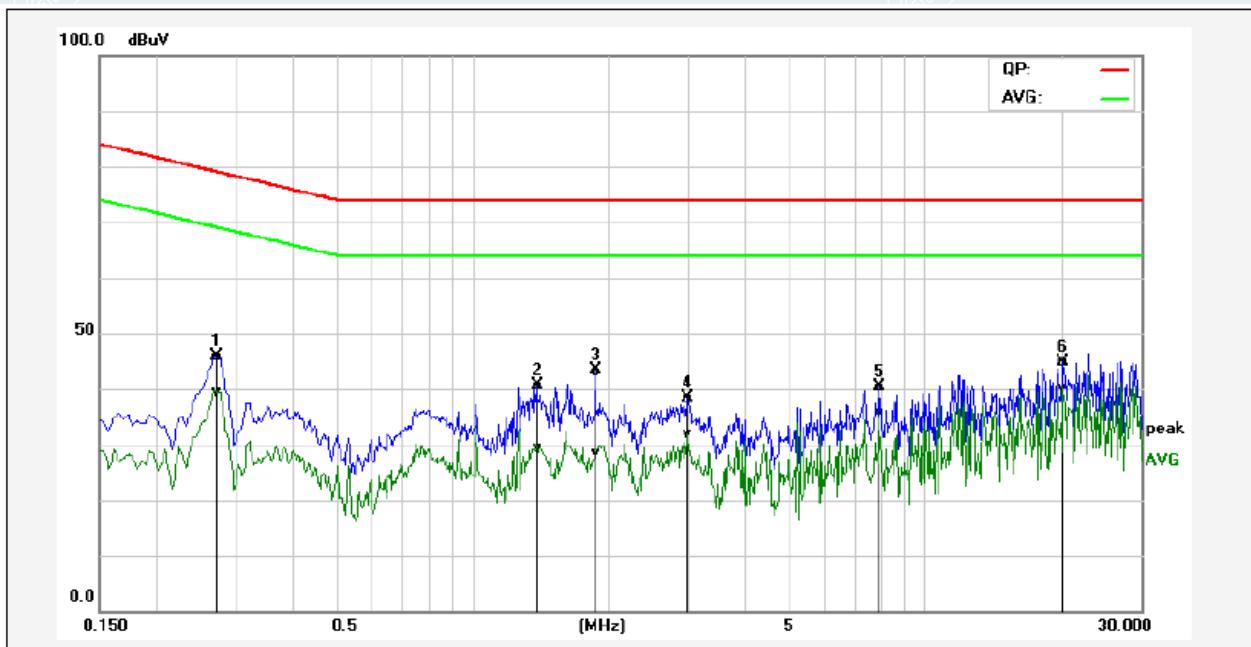
Please refer to the attached document E20230331478001-28 CE-Test Photo.

----- The following blanks -----

6.3.6. TEST RESULTS

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	21.7°C/49%RH/101kPa	Test Mode	Mode 2
Power supply	AC 230V/50Hz	Tested By	Chen Zexin
Test Date	2023-11-29	Sample No.	E20230331478001-0005

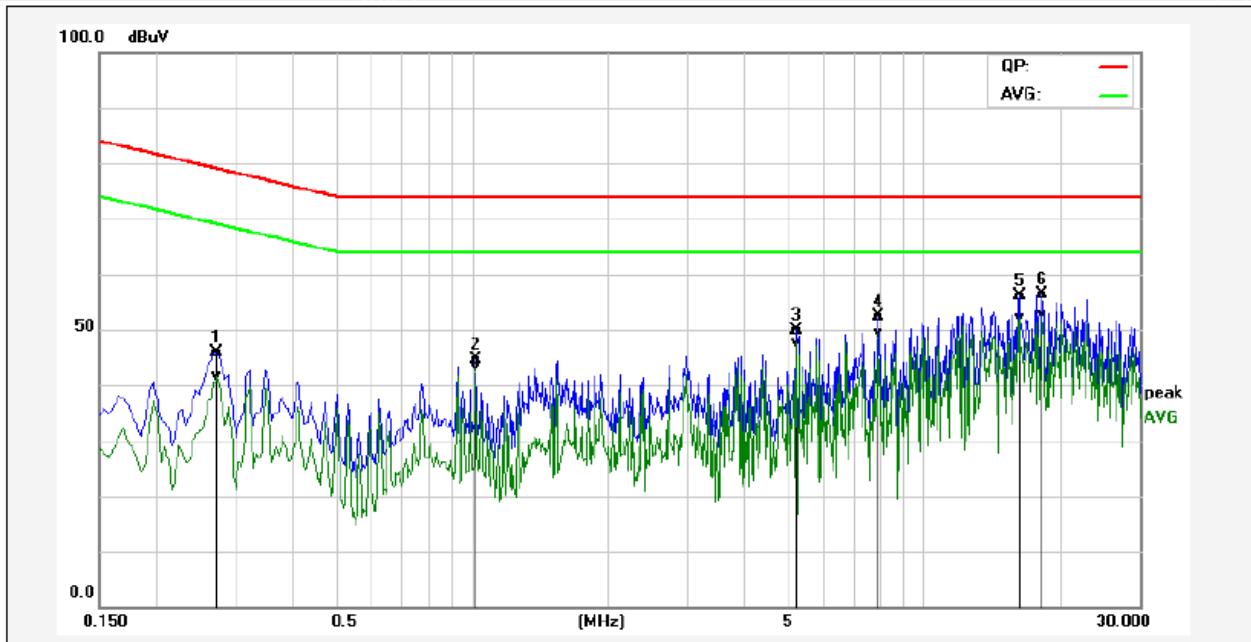
Line: LAN port (1000Mbps)



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.2740	35.89	29.29	9.99	45.88	39.28	78.99	69.00	-33.11	-29.72	Pass
2	1.3940	30.87	19.63	9.77	40.64	29.40	74.00	64.00	-33.36	-34.60	Pass
3	1.8740	33.48	18.59	9.77	43.25	28.36	74.00	64.00	-30.75	-35.64	Pass
4	3.0059	28.57	22.21	9.79	38.36	32.00	74.00	64.00	-35.64	-32.00	Pass
5	7.9260	30.42	25.71	9.96	40.38	35.67	74.00	64.00	-33.62	-28.33	Pass
6*	20.2580	34.75	30.15	10.06	44.81	40.21	74.00	64.00	-29.19	-23.79	Pass

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	21.7°C/49%RH/101kPa	Test Mode	Mode 2
Power supply	AC 230V/50Hz	Tested By	Chen Zexin
Test Date	2023-11-29	Sample No.	E20230331478001-0005

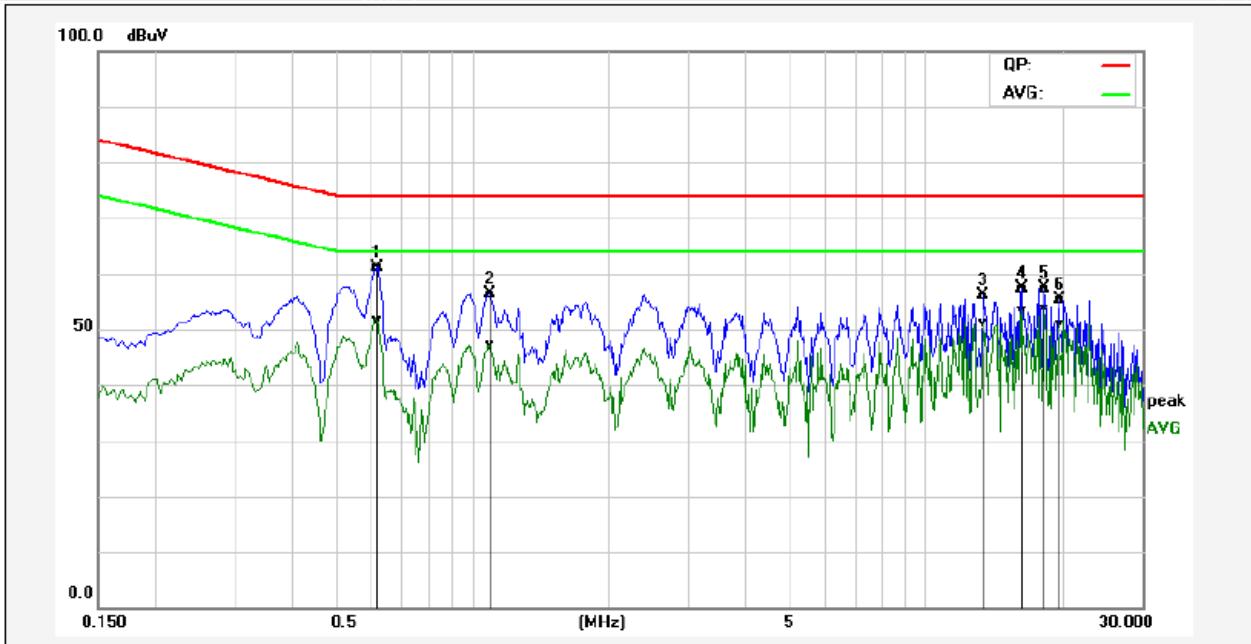
Line: LAN port (100Mbps)



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.2740	36.07	31.63	9.88	45.95	41.51	78.99	69.00	-33.04	-27.49	Pass
2	1.0220	35.13	33.41	9.62	44.75	43.03	74.00	64.00	-29.25	-20.97	Pass
3	5.2380	40.32	38.02	9.51	49.83	47.53	74.00	64.00	-24.17	-16.47	Pass
4	7.9220	42.85	39.89	9.50	52.35	49.39	74.00	64.00	-21.65	-14.61	Pass
5	16.2300	46.69	42.53	9.52	56.21	52.05	74.00	64.00	-17.79	-11.95	Pass
6*	18.2420	46.74	43.20	9.54	56.28	52.74	74.00	64.00	-17.72	-11.26	Pass

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	21.7°C/49%RH/101kPa	Test Mode	Mode 2
Power supply	AC 230V/50Hz	Tested By	Chen Zexin
Test Date	2023-11-29	Sample No.	E20230331478001-0005

Line: LAN port (10Mbps)



No.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
1	0.6180	51.48	42.05	9.69	61.17	51.74	74.00	64.00	-12.83	-12.26	Pass
2	1.0980	46.72	37.64	9.61	56.33	47.25	74.00	64.00	-17.67	-16.75	Pass
3	13.3580	46.55	41.73	9.50	56.05	51.23	74.00	64.00	-17.95	-12.77	Pass
4	16.2300	47.75	43.96	9.52	57.27	53.48	74.00	64.00	-16.73	-10.52	Pass
5*	18.2420	47.80	44.12	9.54	57.34	53.66	74.00	64.00	-16.66	-10.34	Pass
6	19.7099	45.75	41.38	9.55	55.30	50.93	74.00	64.00	-18.70	-13.07	Pass

6.4 HARMONIC CURRENT

Test Requirement: ETSI EN 301 489-1
 ETSI EN 301 489-3
 ETSI EN 301 489-17
 EN IEC 61000-3-2

Test Method: EN 61000-3-2, EN IEC 61000-3-2

6.4.1 LIMITS

Limits for Class A equipment		Limits for Class D equipment		
Harmonics Order n	Max. permissible harmonics current A	Harmonics Order n	Max. permissible harmonics current per watt mA/W	Max. permissible harmonics current A
Odd harmonics		Odd Harmonics only		
3	2.30	3	3.4	2.30
5	1.14	5	1.9	1.14
7	0.77	7	1.0	0.77
9	0.40	9	0.5	0.40
11	0.33	11	0.35	0.33
13	0.21	13	0.30	0.21
$15 \leq n \leq 39$	$0.15 \times 15/n$	$15 \leq n \leq 39$	$3.85/n$	$0.15 \times 15/n$
Even harmonics				
2	1.08			
4	0.43			
6	0.30			
$8 \leq n \leq 40$	$0.23 \times 8/n$			

Note:

1. Class A and Class D are classified according to item 6.4.2.
2. All equipment except for lighting equipment having an active input power > 75 W and no limits apply for equipment with an active input power up to and including 75 W.

----- The following blanks -----

6.4.2 TEST PROCEDURE

The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn.

The EUT is classified as follows:

Class A: Balanced three-phase equipment, Household appliances excluding equipment as Class D, Tools excluding portable tools, Dimmers for incandescent lamps, audio equipment, equipment not specified in one of the three other classes.

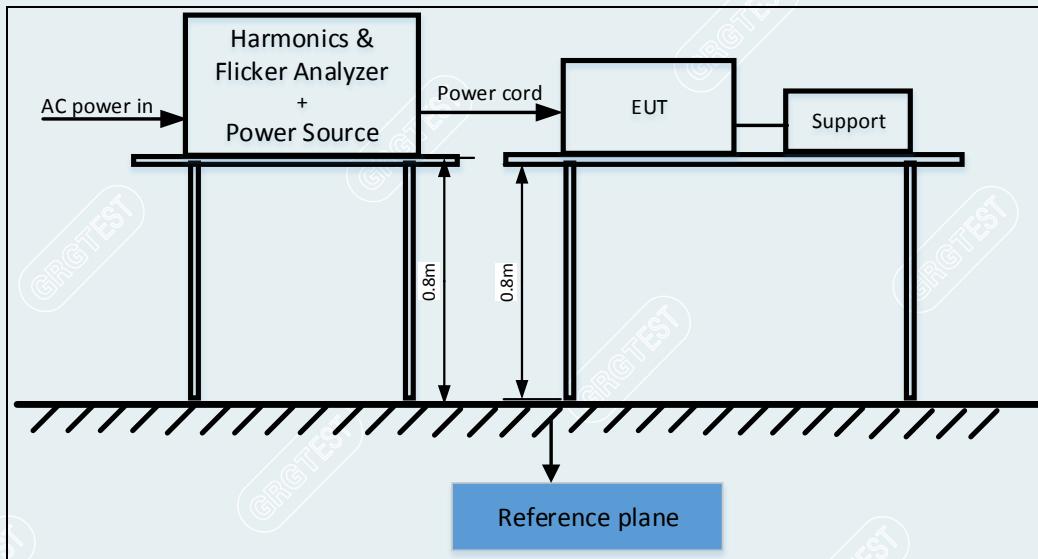
Class B: Portable tools; Arc welding equipment which is not professional equipment.

Class C: Lighting equipment.

Class D: Equipment having a specified power less than or equal to 600 W of the following types: Personal computers and personal computer monitors and television receivers.

The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the time necessary for the EUT to be exercised.

6.4.3 TEST SETUP



6.4.4 PHOTOGRAPH OF THE TEST ARRANGEMENT

Please refer to the attached document E20230331478001-28 CE-Test Photo.

6.4.5 TEST RESULTS

Pre-scan all modes, the worst mode is Mode 1 and recorded the results in this report.

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	22.6°C/54%RH/101kPa	Test Mode	Mode 1
Power supply	AC 230V/50Hz	Tested By	Chen Zexin
Test Date	2023-11-29	Sample No.	E20230331478001-0005

Test category: Class-A (European limits)

Test Margin: 100

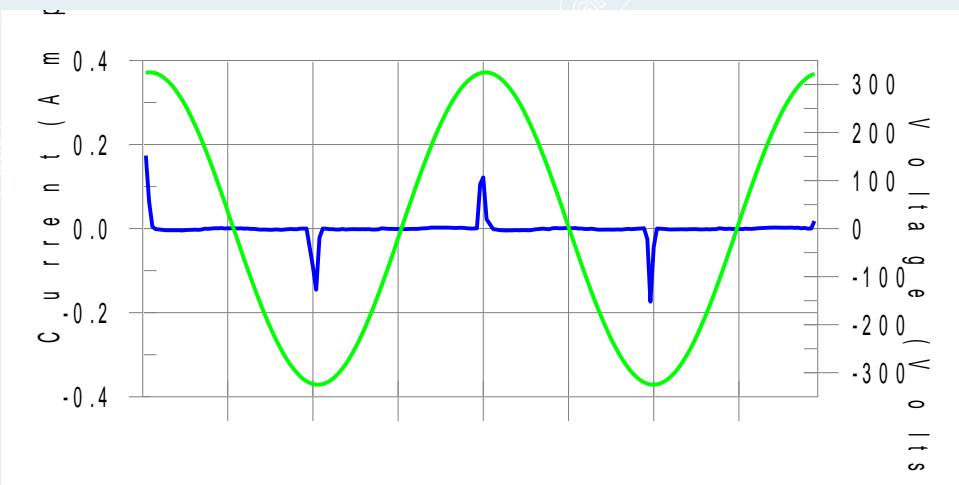
Test duration (min): 2.5

Data file name: H-000759.cts_data

Test Result: Pass

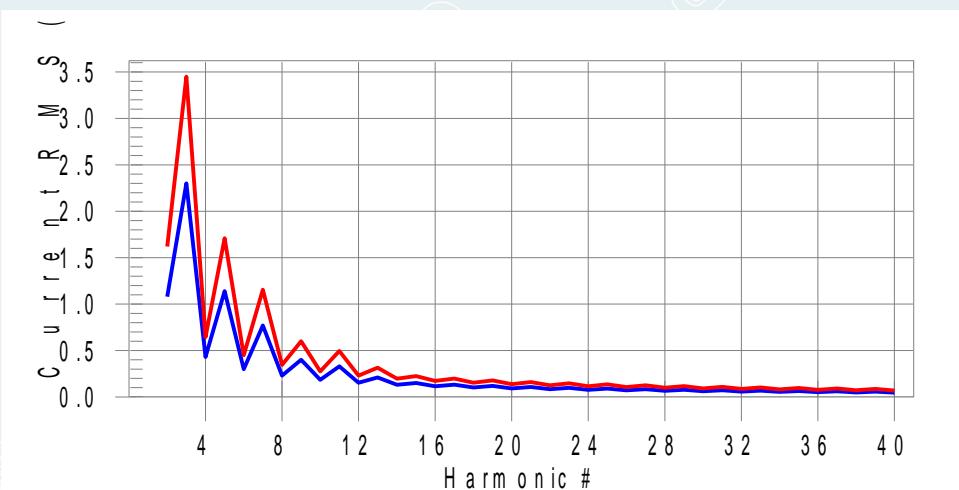
Source qualification: Normal

Current & voltage waveforms



Harmonics and Class A limit line

European Limits



Test result: Pass

Worst harmonics H21-3.2% of 150% limit, H21-4.8% of 100% limit

Test category: Class-A (European limits)

Test Margin: 100

Test duration (min): 2.5

Data file name: H-000759.cts_data

Test Result: Pass

Source qualification: Normal

THC(A): 0.022

I-THD(%): 313.7

POHC(A): 0.012

POHC Limit(A): 0.251

Highest parameter values during test:

V_RMS (Volts): 230.04

Frequency(Hz): 50.00

I_Peak (Amps): 0.205

I_RMS (Amps): 0.025

I_Fund (Amps): 0.007

Crest Factor: 8.476

Power (Watts): 1.6

Power Factor: 0.296

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	1.080	N/A	0.001	1.620	N/A	Pass
3	0.007	2.300	0.3	0.008	3.450	0.2	Pass
4	0.001	0.430	N/A	0.001	0.645	N/A	Pass
5	0.007	1.140	0.6	0.007	1.710	0.4	Pass
6	0.000	0.300	N/A	0.001	0.450	N/A	Pass
7	0.007	0.770	0.9	0.007	1.155	0.6	Pass
8	0.000	0.230	N/A	0.001	0.345	N/A	Pass
9	0.007	0.400	1.6	0.007	0.600	1.1	Pass
10	0.000	0.184	N/A	0.001	0.276	N/A	Pass
11	0.006	0.330	1.9	0.006	0.495	1.3	Pass
12	0.000	0.153	N/A	0.001	0.230	N/A	Pass
13	0.006	0.210	2.9	0.006	0.315	2.0	Pass
14	0.000	0.131	N/A	0.001	0.197	N/A	Pass
15	0.006	0.150	3.9	0.006	0.225	2.7	Pass
16	0.000	0.115	N/A	0.001	0.173	N/A	Pass
17	0.006	0.132	4.3	0.006	0.198	2.9	Pass
18	0.000	0.102	N/A	0.001	0.153	N/A	Pass
19	0.005	0.118	4.6	0.005	0.178	3.0	Pass
20	0.000	0.092	N/A	0.001	0.138	N/A	Pass
21	0.005	0.107	4.8	0.005	0.161	3.2	Pass
22	0.000	0.084	N/A	0.001	0.125	N/A	Pass
23	0.005	0.098	N/A	0.005	0.147	N/A	Pass
24	0.000	0.077	N/A	0.001	0.115	N/A	Pass
25	0.004	0.090	N/A	0.005	0.135	N/A	Pass
26	0.000	0.071	N/A	0.001	0.107	N/A	Pass
27	0.004	0.083	N/A	0.004	0.125	N/A	Pass
28	0.000	0.066	N/A	0.001	0.099	N/A	Pass
29	0.004	0.078	N/A	0.004	0.116	N/A	Pass
30	0.000	0.061	N/A	0.001	0.092	N/A	Pass
31	0.004	0.073	N/A	0.004	0.109	N/A	Pass
32	0.000	0.058	N/A	0.000	0.086	N/A	Pass
33	0.003	0.068	N/A	0.003	0.102	N/A	Pass
34	0.000	0.054	N/A	0.000	0.081	N/A	Pass
35	0.003	0.064	N/A	0.003	0.096	N/A	Pass
36	0.000	0.051	N/A	0.000	0.077	N/A	Pass
37	0.003	0.061	N/A	0.003	0.091	N/A	Pass
38	0.000	0.048	N/A	0.000	0.073	N/A	Pass
39	0.002	0.058	N/A	0.002	0.087	N/A	Pass
40	0.000	0.046	N/A	0.000	0.069	N/A	Pass

Test category: Class-A (European limits) **Test Margin: 100**
Test duration (min): 2.5 **Data file name: H-000759.cts_data**

Test Result: Pass **Source qualification: Normal**

Highest parameter values during test:

Voltage (Vrms):	230.04	Frequency(Hz):	50.00
I_Peak (Amps):	0.205	I_RMS (Amps):	0.025
I_Fund (Amps):	0.007	Crest Factor:	8.476
Power (Watts):	1.6	Power Factor:	0.296

Harm#	Harmonics	V-rms	Limit V-rms	% of Limit	Status
2		0.170	0.460	36.96	OK
3		0.433	2.070	20.92	OK
4		0.063	0.460	13.66	OK
5		0.055	0.920	5.95	OK
6		0.038	0.460	8.29	OK
7		0.023	0.690	3.40	OK
8		0.021	0.460	4.56	OK
9		0.018	0.460	3.97	OK
10		0.034	0.460	7.35	OK
11		0.017	0.230	7.32	OK
12		0.020	0.230	8.89	OK
13		0.013	0.230	5.76	OK
14		0.010	0.230	4.40	OK
15		0.012	0.230	5.11	OK
16		0.013	0.230	5.55	OK
17		0.015	0.230	6.39	OK
18		0.014	0.230	6.09	OK
19		0.011	0.230	4.85	OK
20		0.012	0.230	5.35	OK
21		0.009	0.230	4.07	OK
22		0.008	0.230	3.39	OK
23		0.012	0.230	5.27	OK
24		0.006	0.230	2.58	OK
25		0.007	0.230	2.91	OK
26		0.010	0.230	4.41	OK
27		0.011	0.230	4.70	OK
28		0.008	0.230	3.59	OK
29		0.004	0.230	1.86	OK
30		0.009	0.230	3.81	OK
31		0.008	0.230	3.55	OK
32		0.005	0.230	2.35	OK
33		0.005	0.230	2.17	OK
34		0.004	0.230	1.76	OK
35		0.007	0.230	3.16	OK
36		0.003	0.230	1.40	OK
37		0.003	0.230	1.31	OK
38		0.003	0.230	1.29	OK
39		0.007	0.230	3.26	OK
40		0.005	0.230	2.32	OK

6.5 VOLTAGE FLUCTUATIONS AND FLICKER

Test Requirement:	ETSI EN 301 489-1 ETSI EN 301 489-3 ETSI EN 301 489-17 EN 61000-3-3
Test Method:	EN 61000-3-3

6.5.1 LIMITS

The following limits apply:

- the value of Pst shall not be greater than 1.0;
- the value of Plt shall not be greater than 0.65;
- Tmax, the accumulated time value of d(t) with a deviation exceeding 3.3 % during a single voltage change at the EUT terminals, shall not exceed 500 ms;
- the maximum relative steady-state voltage change, dc, shall not exceed 3.3 %;
- the maximum relative voltage change dmax, shall not exceed:
 - a) 4 % without additional conditions;
 - b) 6 % for equipment which is:
 - switched manually, or
 - switched automatically more frequently than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds), or manual restart, after a power supply interruption

NOTE The cycling frequency is further limited by the Pst and Plt limits. For example: a dmax of 6 % producing a rectangular voltage change characteristic twice per hour gives a Plt of about 0.65.

c) 7 % for equipment which is:

- attended whilst in use (for example: hair dryers, vacuum cleaners, kitchen equipment such as mixers, garden equipment such as lawn mowers, portable tools such as electric drills), or
- switched on automatically, or is intended to be switched on manually, no more than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds) or manual restart, after a power supply interruption.

In the case of equipment having several separately controlled circuits in accordance with 6.6, limits b) and c) shall apply only if there is delayed or manual restart after a power supply interruption; for all equipment with automatic switching which is energized immediately on restoration of supply after a power supply interruption, limits a) shall apply; for all equipment with manual switching, limits b) or c) shall apply depending on the rate of switching.

Pst and Plt requirements shall not be applied to voltage changes caused by manual switching.

The limits shall not be applied to voltage changes associated with emergency switching or emergency interruptions.

----- The following blanks -----

6.5.2 TEST PROCEDURES

- a) Let the EUT work in test modes.
- b) Measurement using the Harmonic & Flicker Tester controlled by computer.
- c) During the flick measurement, the measure time shall include that part of whole operation cycle in which the EUT produce the most unfavorable sequence of voltage changes. The observation period for short-term flicker indicator is 10 minutes.

d) For table-top equipment

The equipment to be tested is placed in the test facility on a non-conductive table 0.8 m(± 0.01 m) high.

e) For floor-standing equipment

The equipment to be tested is placed in the test facility on insulating support of 0.05 m to 0.15 m thick.

6.5.3 TEST SETUP

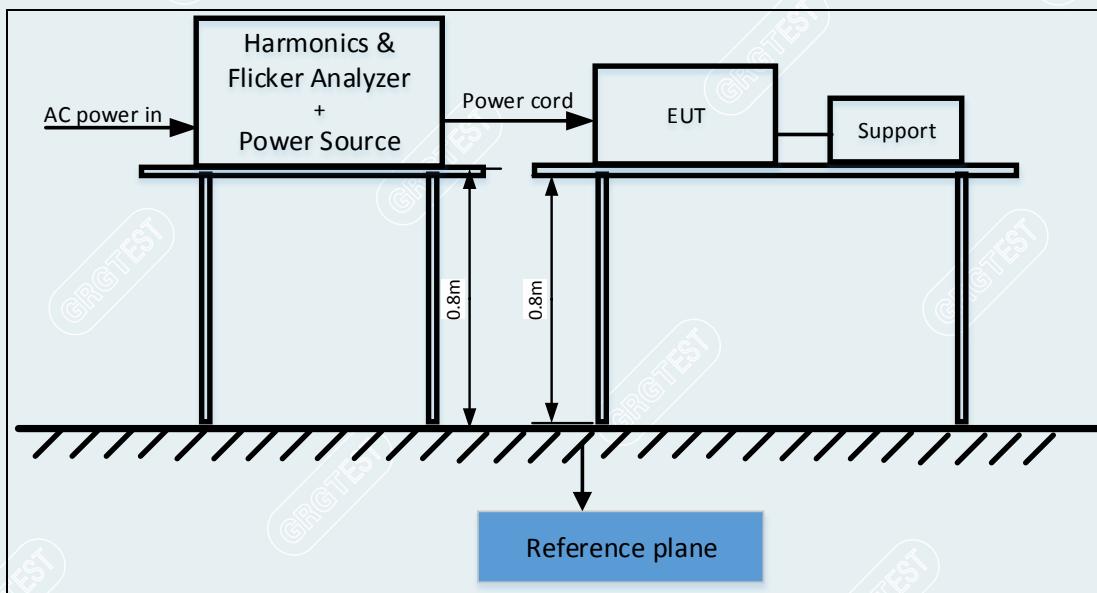


Figure 6.5-1: Test arrangement for Voltage fluctuations and flicker measurement.

6.5.4 PHOTOGRAPH OF THE TEST ARRANGEMENT

Please refer to the attached document E20230331478001-28 CE-Test Photo.

6.5.5 TEST RESULTS

Pre-scan all modes, the worst mode is Mode 1 and recorded the results in this report.

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	22.6°C/54%RH/101kPa	Test Mode	Mode 1
Power supply	AC 230V/50Hz	Tested By	Chen Zixin
Test Date	2023-11-29	Sample No.	E20230331478001-0005

Test category: All parameters (European limits) Test Margin: 100

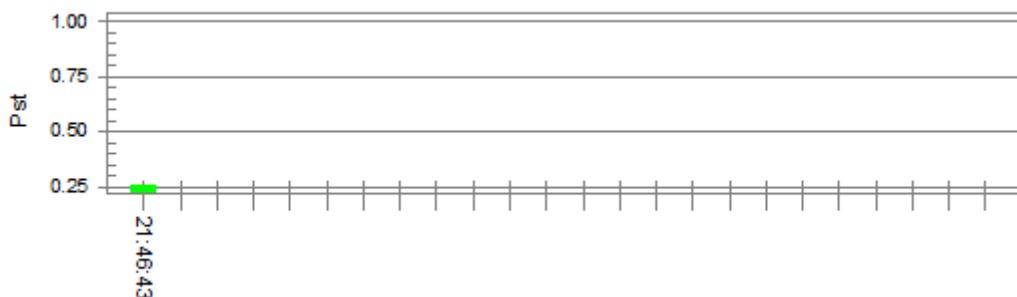
Test duration (min): 10 Data file name: F-000757.cts_data

Test Result: Pass

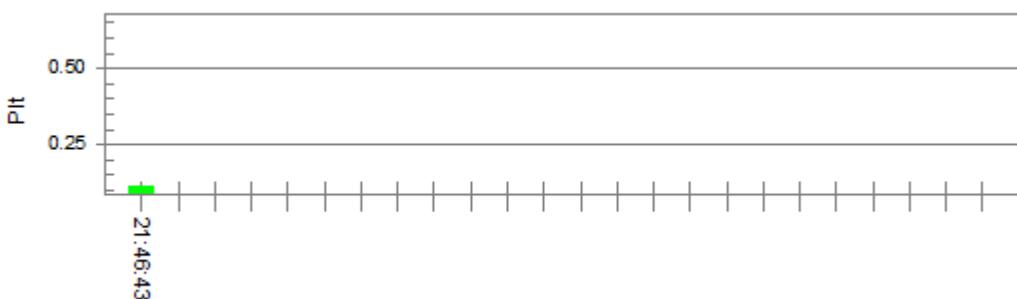
Status: Test Completed

Pst; and limit line

European Limits



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt): 229.97

Highest dt (%):

T-max (mS): 0

Test limit (%):

Test limit (mS): 500.0

Pass

Highest dc (%): 0.00

Test limit (%): 3.30

Pass

Highest dmax (%): 0.00

Test limit (%): 4.00

Pass

Highest Pst (10 min. period): 0.261

Test limit: 1.000

Pass

Highest Plt (2 hr. period): /

Test limit: 0.650

/

7. IMMUNITY TEST

7.1 GENERAL DESCRIPTION

Test Item	Test Specification Level	Basic Standard	Test method	Test Ports	Performance criteria
Electrostatic discharge (ESD)	Contact Discharge: $\pm 4\text{kV}$ Air Discharge: $\pm 2\text{kV}$, $\pm 4\text{kV}$, $\pm 8\text{kV}$ (Direct mode) HCP discharge: $\pm 4\text{kV}$ VCP discharge: $\pm 4\text{kV}$ (Indirect mode)	ETSI EN 301 489-3 V2.3.2 (2023-01)/7.2.1 ETSI EN 301 489-17 V3.2.4 /7.2.1 ETSI EN 301 489-1 V2.2.3/9.3	EN 61000-4-2	Enclosure	B
	EN 55035:2017+A11:2020 Table 1	IEC 61000-4-2			
Continuous RF electromagnetic field disturbances	Frequency range: 80MHz to 6000MHz, 3V/m(unmodulated, r.m.s), 1kHz Sine Wave, 80% AM modulated	ETSI EN 301 489-3 V2.3.2 (2023-01)/7.2.1 ETSI EN 301 489-1 V2.2.3/9.2 ETSI EN 301 489-17 V3.2.4 /7.2.1	EN 61000-4-3	Enclosure	A
Continuous RF electromagnetic field disturbances	Frequency range: 80MHz to 1000MHz, 1800MHz, 2600MHz, 3500MHz , 5000MHz, 3V/m(unmodulated, r.m.s), 1kHz Sine Wave, 80% AM modulated	EN 55035:2017+A11:2020 Table 1	IEC 61000-4-3	Enclosure	A
Power frequency magnetic field	1A/m(r.m.s) 50Hz and 60Hz	EN 55035:2017+A11:2020 Table 1	EN 61000-4-8	Enclosure	A
Electrical fast transients(EFT)	Test specification: AC power Port: $\pm 1\text{kV}$ repetition rate: 5kHz Signal Port: $\pm 0.5\text{kV}$ repetition rate: 5kHz	ETSI EN 301 489-1 V2.2.3 /9.4 ETSI EN 301 489-3 V2.3.2 (2023-01)/7.2.1 ETSI EN 301 489-17 V3.2.4 /7.2.1	EN 61000-4-4	AC mains power input port/signal ports	B
Electrical fast transients(EFT)	Test specification: AC power Port: $\pm 1\text{kV}$ repetition rate: 5kHz Signal Port: $\pm 0.5\text{kV}$ repetition rate: 5kHz	EN 55035:2017+A11:2020 Table 4	IEC 61000-4-4	AC mains power input port/signal ports	B
Surge	Test specification: AC Power Port: 1.2/50 us pulse line to line: $\pm 0.5\text{kV}, \pm 1\text{kV};$	ETSI EN 301 489-1 V2.2.3/9.8 ETSI EN 301 489-3 V2.3.2 (2023-01)/7.2.1 ETSI EN 301 489-17 V3.2.4 /7.2.1	EN 61000-4-5	AC mains power input port	B
Surge	Test specification: AC Power Port: 1.2/50 us pulse line to line: $\pm 0.5\text{kV}, \pm 1\text{kV};$	EN 55035:2017+A11:2020 Table 4	IEC 61000-4-5	AC mains power input port	B
Radio frequency continuous	Test specification: AC power port/signal ports	ETSI EN 301 489-1 V2.2.3/9.5	EN 61000-4-6	AC mains power	A

conducted(CS)	0.15~80MHz, 3Vrms, 80%AM, 1kHz	ETSI EN 301 489-3 V2.3.2 (2023-01)/7.2.1 ETSI EN 301 489-17 V3.2.4 /7.2.1		input port/signal ports		
Radio frequency continuous conducted(CS)	Test specification: AC power port/signal ports 0.15~10MHz, 3Vrms, 80%AM, 1kHz 10MHz ~ 30MHz, 3-1Vrms, 80% AM, 1kHz 30MHz ~ 80MHz, 1Vrms, 80% AM, 1kHz	EN 55035:2017+A11:2020 Table 4	IEC 61000-4-6	AC mains power input port/signal ports	A	
Voltage Dips & Short Interruptions	Voltage dips: i)0% residual voltage 0.5 cycle. ii)0% residual voltage 1 cycle,	ETSI EN 301 489-3 V2.3.2 (2023-01)/7.2.1 ETSI EN 301 489-17 V3.2.4 /7.2.1	EN 61000-4-11	AC mains power input port	B	
	Voltage dips: 70% residual voltage 25 cycle	ETSI EN 301 489-1 V2.2.3/9.7			C	
	Voltage interruption: 0% residual voltage during 250 cycles.	ETSI EN 301 489-1 V2.2.3/9.7			C	
Voltage Dips & Short Interruptions	Voltage dips: 0% residual voltage 0.5 cycle.	EN 55035:2017+A11:2020 Table 4	IEC 61000-4-11	AC mains power input port	B	
	Voltage dips: 70% residual voltage 25 cycle					C
	Voltage interruption: 0% residual voltage during 250 cycles.					C

----- The following blanks -----

7.2 GENERAL PERFORMANCE CRITERIA DESCRIPTION (ETSI EN 301 489-1/-3/-17)

7.2.1 GENERAL PERFORMANCE CRITERIA

The performance criteria are:

- Performance criteria A for immunity tests with phenomena of a continuous nature;
- Performance criteria B for immunity tests with phenomena of a transient nature;
- Performance criteria C for immunity tests with power interruptions exceeding a certain time.

The equipment shall meet the minimum performance criteria as specified in the following clauses.

Performance table

Criteria	During Test	After test (i.e. as a result of the application of the test)
A	Shall operate as intended. (See note). Shall be no loss of function. Shall be no unintentional transmissions.	Shall operate as intended. Shall be no degradation of performance. Shall be no loss of function. Shall be no loss of critical stored data.
B	May be loss of function.	Functions shall be self-recoverable. Shall operate as intended after recovering. Shall be no loss of critical stored data.
C	May be loss of function.	Functions shall be recoverable by the operator. Shall operate as intended after recovering. Shall be no loss of critical stored data.

NOTE: Operate as intended during the test allows a level of degradation in accordance with clause 6.2.2.

Performance Criteria	Description
Performance criteria for continuous phenomena applied to transmitters and receivers	If no further details are given in the relevant part of EN 301 489 series [i.13] dealing with the particular type of radio equipment, the following general performance criteria for continuous phenomena shall apply. During and after the test, the apparatus shall continue to operate as intended. No degradation of performance or loss of function is allowed below a permissible performance level specified by the manufacturer when the apparatus is used as intended. In some cases this permissible performance level may be replaced by a permissible loss of performance. During the test the EUT shall not unintentionally transmit or change its actual operating state and stored data. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be deduced from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.
Performance criteria for transient phenomena applied to transmitters and receivers	If no further details are given in the relevant part of EN 301 489 series [i.13] dealing with the particular type of radio equipment, the following general performance criteria for transient phenomena shall apply. For surges applied to symmetrically operated wired network ports intended to be connected directly to outdoor lines the following criteria applies: <ul style="list-style-type: none"> • For products with only one symmetrical port intended for connection to outdoor lines, loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. A SW reboot is not allowed.

	<p>Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.</p> <ul style="list-style-type: none"> For products with more than one symmetrical port intended for connection to outdoor lines, loss of function on the port under test is allowed, provided the function is self-recoverable. A SW reboot is not allowed. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost. <p>For all other ports the following applies:</p> <ul style="list-style-type: none"> After the test, the equipment shall continue to operate as intended. No degradation of performance or loss of function is allowed below a permissible performance level specified by the manufacturer, when the equipment is used as intended. In some cases this permissible performance level may be replaced by a permissible loss of performance. During the EMC exposure to an electromagnetic phenomenon, a degradation of performance is, however, allowed. No change of the actual mode of operation (e.g. unintended transmission) or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be deduced from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.
Performance criteria for equipment which does not provide a continuous communication link	For radio equipment which does not provide a continuous communication link, the performance criteria described in clauses 6.1 and 6.2 are not appropriate, in these cases the manufacturer shall declare, for inclusion in the test report, his own specification for an acceptable level of performance or degradation of performance during and/or after the immunity tests. The performance specification shall be included in the product description and documentation. The related specifications set out in clause 5.3 have also to be taken into account. The performance criteria specified by the manufacturer shall give the same degree of immunity protection as called for in clauses 6.1 and 6.2.
Performance criteria for ancillary equipment tested on a stand alone basis	If ancillary equipment is intended to be tested on a stand alone basis, the performance criteria described in clauses 6.1 and 6.2 are not appropriate, in these cases the manufacturer shall declare, for inclusion in the test report, his own specification for an acceptable level of performance or degradation of performance during and/or after the immunity tests. The performance specification shall be included in the product description and documentation. The related specifications set out in clause 5.3 have also to be taken into account. The performance criteria specified by the manufacturer shall give the same degree of immunity protection as called for in clauses 6.1 and 6.2.

Performance Criteria	Description
CT	<p>The performance criteria A shall apply.</p> <p>Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an ACKnowledgement (ACK) or Not ACKnowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.</p>
TT	<p>The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5 000 ms duration, for which performance criteria C shall apply. Tests shall be repeated with the EUT in standby mode (if applicable) to ensure that unintentional transmission does not occur. In systems using acknowledgement signals, it is recognized that an acknowledgement (ACK) or not-acknowledgement (NACK) transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.</p>
CR	<p>The performance criteria A shall apply.</p> <p>Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test. In systems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.</p>
TR	<p>The performance criteria B shall apply, except for voltage dips of 100 ms and voltage interruptions of 5 000 ms duration for which performance criteria C shall apply. Where the EUT is a transceiver, under no circumstances, shall the transmitter operate unintentionally during the test. In systems using acknowledgement signals, it is recognized that an ACK or NACK transmission may occur, and steps should be taken to ensure that any transmission resulting from the application of the test is correctly interpreted.</p>

Note:

Criterion A applies for immunity tests with phenomena of a continuous nature. (CT, CR)

Criterion B applies for immunity tests with phenomena of a transient nature. (TT, TR)

Criterion C for immunity tests with power interruptions exceeding a certain time.

7.2.2 MINIMUM PERFORMANCE LEVEL

For equipment that supports a PER or FER, the minimum performance level shall be a PER or FER less than or equal to 10 %.

For equipment that does not support a PER or a FER, the minimum performance level shall be no loss of the wireless transmission function needed for the intended use of the equipment.

7.2.3 PERFORMANCE CRITERIA FOR CONTINUOUS PHENOMENA

The performance criteria A shall apply.

Where the EUT is a transmitter in standby mode, unintentional transmission shall not occur during the test.

Where the EUT is a transceiver in receive mode, unintentional transmission shall not occur during the test.

7.2.4 PERFORMANCE CRITERIA FOR TRANSIENT PHENOMENA

The performance criteria B shall apply, except for voltage dips greater than or equal to 100 ms and voltage interruptions of 5 000 ms duration, for which performance criteria C shall apply.

Where the EUT is a transmitter in standby mode, unintentional transmission shall not occur as a result of the application of the test.

Where the EUT is a transceiver in receive mode, unintentional transmission shall not occur as a result of the application of the test.

7.3 GENERAL PERFORMANCE CRITERIA DESCRIPTION (EN 55035)

7.3.1 GENERAL PERFORMANCE CRITERIA

Performance criterion A

The equipment shall continue to operate as intended without operator intervention. No degradation of performance, loss of function or change of operating state is allowed below a performance level specified by the manufacturer when the equipment is used as intended.

The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

Performance criterion B

During the application of the disturbance, degradation of performance is allowed. However, no unintended change of actual operating state or stored data is allowed to persist after the test.

After the test, the equipment shall continue to operate as intended without operator intervention; no degradation of performance or loss of function is allowed, below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.

If the minimum performance level (or the permissible performance loss), or recovery time, is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.

Performance criterion C

Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. A reboot or re-start operation is allowed.

Information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

7.4 ELECTROSTATIC DISCHARGE(ESD)

7.4.1 TEST SPECIFICATION

Test Requirement:	ETSI EN 301 489-1 ETSI EN 301 489-3 ETSI EN 301 489-17 EN 55035
Test Method:	EN 61000-4-2, IEC 61000-4-2
Discharge Impedance:	330 ohm / 150 pF
Discharge Voltage:	Contact Discharge: $\pm 4\text{kV}$ Air Discharge: $\pm 2\text{kV}$, $\pm 4\text{kV}$, $\pm 8\text{kV}$ (Direct mode) HCP discharge: $\pm 4\text{kV}$ VCP discharge: $\pm 4\text{kV}$ (Indirect mode)
Polarity:	Positive & Negative
Number of Discharge:	10 times at each test point
Discharge Mode:	Single Discharge 1 second
Performance criteria	B

7.4.2 TEST PROCEDURE

The basic test procedure was in accordance with EN 61000-4-2 & IEC 61000-4-2:

The test generator necessary to perform direct and indirect application of discharges to the EUT in the following manner:

- (1) The test shall be performed with single discharges. On each pre-selected point at least 10single discharges (in the most sensitive polarity) shall be applied.

NOTE 1 The minimum number of discharges applied is depending on the EUT; for products with synchronized circuits the number of discharges should be larger.

For the time interval between successive single discharges an initial value of 1 s is recommended. Longer intervals may be necessary to determine whether a system failure has occurred.

NOTE 2 The points to which the discharges should be applied may be selected by means of an exploration carried out at a repetition rate of 20 discharges per second, or more.

Vertical Coupling Plane (VCP):

The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance 0.1mfrom, the EUT, with the Discharge Electrode touching the coupling plane.

The four faces of the EUT will be performed with electrostatic discharge.

Horizontal Coupling Plane (HCP):

The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the Discharge Electrode touching the coupling plane.

The four faces of the EUT will be performed with electrostatic discharge.

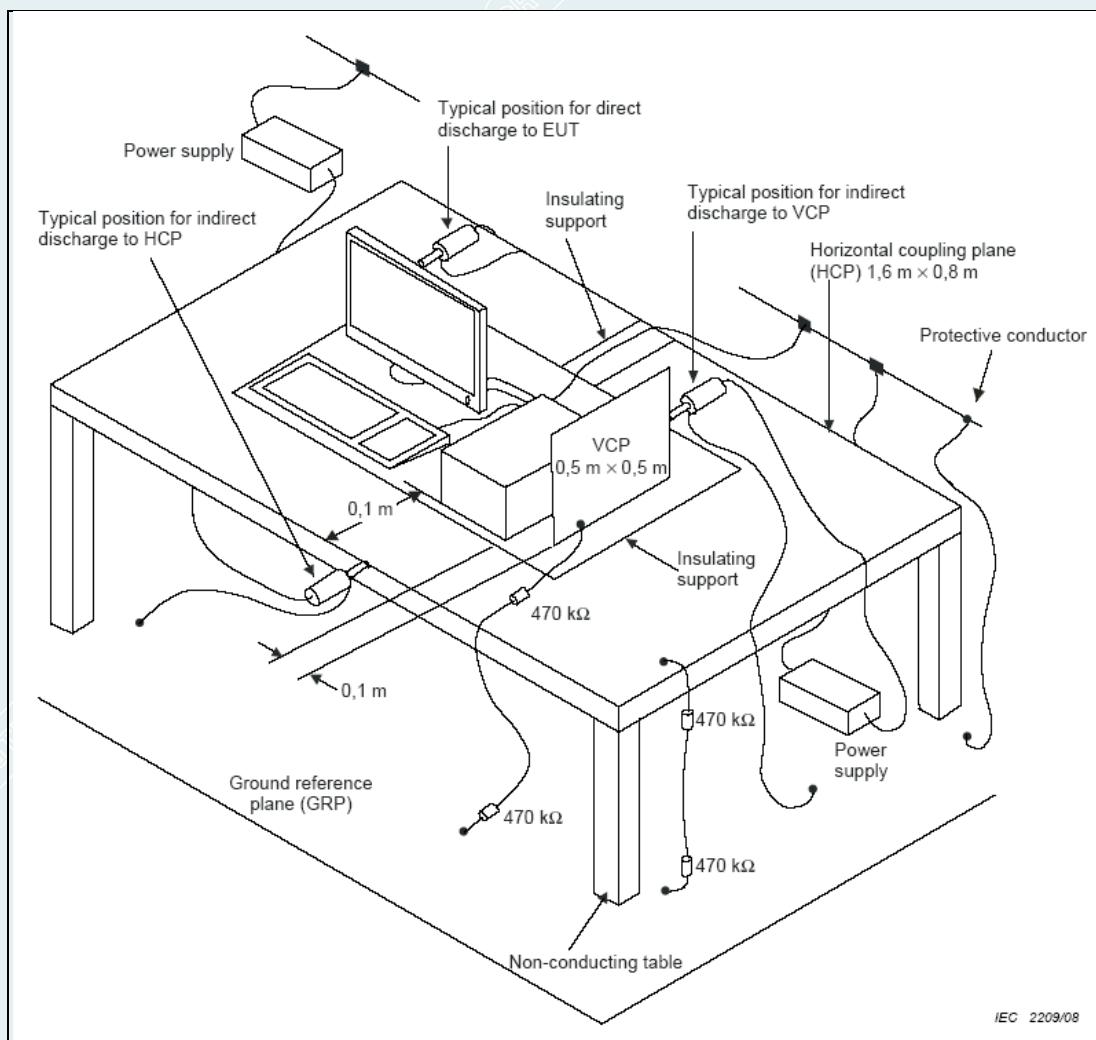
(2) Air discharges at insulation surfaces of the EUT.

It was at least ten single discharges with positive and negative at the same selected point.

(3) For TABLE-TOP equipment:

The configuration consisted of a wooden table 0.8 meters high standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system. A Horizontal Coupling Plane (1.6m x 0.8m) was placed on the table and attached to the GRP by means of a cable with 940k total impedance. The equipment under test was installed in a representative system as described in EN 61000-4-2, and its cables were placed on the HCP and isolated by an insulating support of 0.5mm thickness. A distance of 1-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

7.4.3 TEST SETUP



7.4.4 PHOTOGRAPH OF THE TEST ARRANGEMENT

Please refer to the attached document E20230331478001-28 CE-Test Photo.

----- The following blanks -----

7.4.5 TEST RESULTS

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	22.7°C/58%RH/101.0kPa	Test Mode	Mode 1
Power supply	AC 230V/50Hz	Tested By	Chen Zexin
Test Date	2023-12-05	Sample No.	E20230331478001-0005

For ETSI EN 301 489-1 / ETSI EN 301489-3/ ETSI EN 301 489-17:

Discharge point	Discharge voltage	C-Conduct A-Air	Required Performance	Actual performance	Result
Vertical coupling plane	±4kV	C	Criterion B	Criterion A ¹⁾	PASS
Horizontal coupling plane	±4kV	C	Criterion B	Criterion A ¹⁾	PASS
Shell gap	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A ¹⁾	PASS
Indicator light	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A ¹⁾	PASS
Button	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A ¹⁾	PASS
Type-C port	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A ¹⁾	PASS
RJ45 port	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A ¹⁾	PASS

Note:¹⁾ Before test, during test and after test, the EUT working is normal, the EUT function is normal.

For EN55035:

Discharge point	Discharge voltage	C-Conduct A-Air	Required Performance	Actual performance	Result
Vertical coupling plane	±4kV	C	Criterion B	Criterion A ¹⁾	PASS
Horizontal coupling plane	±4kV	C	Criterion B	Criterion A ¹⁾	PASS
Shell gap	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A ¹⁾	PASS
Indicator light	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A ¹⁾	PASS
Button	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A ¹⁾	PASS
Type-C port	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A ¹⁾	PASS
RJ45 port	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A ¹⁾	PASS

Note:¹⁾ Before test, during test and after test, the EUT working is normal, the EUT function is normal.

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	22.7°C/58%RH/101.0kPa	Test Mode	Mode 2
Power supply	AC 230V/50Hz	Tested By	Chen Zexin
Test Date	2023-12-05	Sample No.	E20230331478001-0005

For ETSI EN 301 489-1 / ETSI EN 301489-3/ ETSI EN 301 489-17:

Discharge point	Discharge voltage	C-Conduct A-Air	Required Performance	Actual performance	Result
Vertical coupling plane	±4kV	C	Criterion B	Criterion A ¹⁾	PASS
Horizontal coupling plane	±4kV	C	Criterion B	Criterion A ¹⁾	PASS
Shell gap	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A ¹⁾	PASS
Indicator light	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A ¹⁾	PASS
Button	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A ¹⁾	PASS
Type-C port	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A ¹⁾	PASS
RJ45 port	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A ¹⁾	PASS

Note:¹⁾ Before test, during test and after test, the EUT working is normal, the EUT function is normal.

For EN55035:

Discharge point	Discharge voltage	C-Conduct A-Air	Required Performance	Actual performance	Result
Vertical coupling plane	±4kV	C	Criterion B	Criterion A ¹⁾	PASS
Horizontal coupling plane	±4kV	C	Criterion B	Criterion A ¹⁾	PASS
Shell gap	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A ¹⁾	PASS
Indicator light	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A ¹⁾	PASS
Button	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A ¹⁾	PASS
Type-C port	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A ¹⁾	PASS
RJ45 port	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A ¹⁾	PASS

Note:¹⁾ Before test, during test and after test, the EUT working is normal, the EUT function is normal.

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	22.7°C/58%RH/101.0kPa	Test Mode	Mode 3
Power supply	AC 230V/50Hz	Tested By	Chen Zexin
Test Date	2023-12-05	Sample No.	E20230331478001-0005

For ETSI EN 301 489-1 / ETSI EN 301489-3/ ETSI EN 301 489-17:

Discharge point	Discharge voltage	C-Conduct A-Air	Required Performance	Actual performance	Result
Vertical coupling plane	±4kV	C	Criterion B	Criterion A ¹⁾	PASS
Horizontal coupling plane	±4kV	C	Criterion B	Criterion A ¹⁾	PASS
Shell gap	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A ¹⁾	PASS
Indicator light	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A ¹⁾	PASS
Button	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A ¹⁾	PASS
Type-C port	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A ¹⁾	PASS
RJ45 port	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A ¹⁾	PASS

Note:¹⁾ Before test, during test and after test, the EUT working is normal, the EUT function is normal.

For EN55035:

Discharge point	Discharge voltage	C-Conduct A-Air	Required Performance	Actual performance	Result
Vertical coupling plane	±4kV	C	Criterion B	Criterion A ¹⁾	PASS
Horizontal coupling plane	±4kV	C	Criterion B	Criterion A ¹⁾	PASS
Shell gap	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A ¹⁾	PASS
Indicator light	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A ¹⁾	PASS
Button	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A ¹⁾	PASS
Type-C port	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A ¹⁾	PASS
RJ45 port	±2kV, ±4kV, ±8kV	A	Criterion B	Criterion A ¹⁾	PASS

Note:¹⁾ Before test, during test and after test, the EUT working is normal, the EUT function is normal.

7.5 RADIATED RADIO-FREQUENCY ELECTROMAGNETIC FIELD (RS)

7.5.1 TEST SPECIFICATION

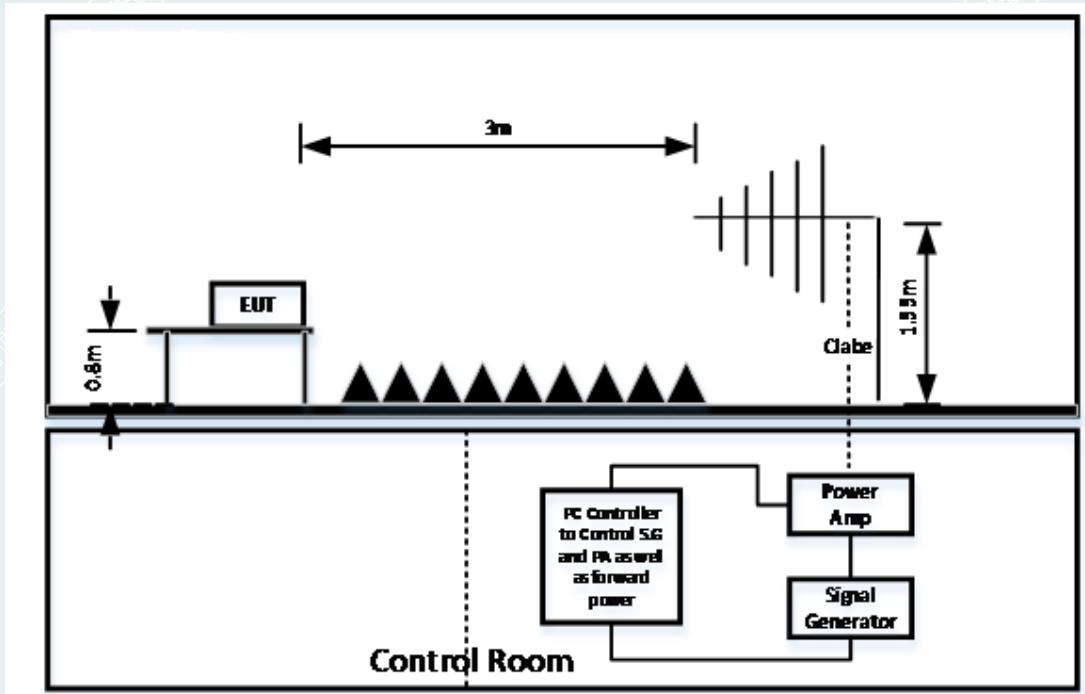
Test Requirement:	ETSI EN 301 489-1 ETSI EN 301 489-3 ETSI EN 301 489-17 EN 55035
Test Method:	EN 61000-4-3, IEC 61000-4-3
Frequency Range:	ETSI EN 301 489-1, ETSI EN 301 489-3, ETSI EN 301 489-17: 80MHz ~ 6000MHz EN 55035: 80MHz~1000MHz, 1800MHz, 2600MHz, 3500MHz, 5000MHz
Field Strength:	3 V/m
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Polarity of Antenna:	Horizontal and Vertical
Test Distance:	3 m
Antenna Height:	1.55m
Residence time	1 seconds
Performance criteria	A

7.5.2 TEST PROCEDURE

- (1) The testing is performed in a fully anechoic chamber. The transmit antenna was located at a distance of 3 meters from the EUT.
- (2) The frequency range is swept from 80 MHz ~6000 MHz, with the signal 80% amplitude modulated with a 1 kHz sine-wave. The rate of sweep did not exceed 1.5×10^{-3} decade/s, where the frequency range is swept incrementally; the step size is 1% of preceding frequency value.
- (3) The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
- (4) The test is performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

----- The following blanks -----

7.5.3 TEST SETUP



NOTE:

(1) Table-top equipment

The EUT installed in a representative system as described in section 7.1 of EN 61000-4-3 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

(2) Floor-standing equipment

The EUT installed in a representative system as described in section 7.2 of EN 61000-4-3 was placed on a non-conductive wood support 0.1 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

Note: the EUT is a table-top equipment.

7.5.4 PHOTOGRAPH OF THE TEST ARRANGEMENT

Please refer to the attached document E20230331478001-28 CE-Test Photo.

7.5.5 TEST RESULTS

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	22.5°C/57%RH/101.0kPa	Test Mode	Mode 1
Power supply	AC 230V/50Hz	Tested By	Chen Zexin
Test Date	2023-11-29	Sample No.	E20230331478001-0005

For ETSI EN 301 489-1/ ETSI EN 301489-3/ ETSI EN 301 489-17:

Frequency (MHz)	Field strength (V/m)	EUT orientation	Antenna polarization	Required criterion	Actual performance	Result
80~6000	3	Front	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass
		Left	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass
		Right	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass
		Rear	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass

NOTE: ¹⁾ Before test, during the test, and after test, the EUT working is normal, the EUT function is normal.

For EN 55035:

Frequency (MHz)	Field strength (V/m)	EUT orientation	Antenna polarization	Required criterion	Actual performance	Result
80~1000	3	Front	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass
		Left	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass
		Right	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass
		Rear	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass
		Front	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass
		Left	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass
		Right	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass
		Rear	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass

NOTE: ¹⁾ Before test, during the test, and after test, the EUT working is normal, the EUT function is normal.

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	22.5°C/57%RH/101.0kPa	Test Mode	Mode 2
Power supply	AC 230V/50Hz	Tested By	Chen Zexin
Test Date	2023-11-29	Sample No.	E20230331478001-0005

For ETSI EN 301 489-1/ ETSI EN 301489-3/ ETSI EN 301 489-17:

Frequency (MHz)	Field strength (V/m)	EUT orientation	Antenna polarization	Required criterion	Actual performance	Result
80~6000	3	Front	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass
		Left	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass
		Right	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass
		Rear	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass

NOTE: ¹⁾ Before test, during the test, and after test, the EUT working is normal, the EUT function is normal.

For EN 55035:

Frequency (MHz)	Field strength (V/m)	EUT orientation	Antenna polarization	Required criterion	Actual performance	Result
80~1000	3	Front	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass
		Left	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass
		Right	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass
		Rear	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass
		Front	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass
1800, 2600, 3500, 5000	3	Left	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass
		Right	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass
		Rear	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass

NOTE: ¹⁾ Before test, during the test, and after test, the EUT working is normal, the EUT function is normal.

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	22.5°C/57%RH/101.0kPa	Test Mode	Mode 3
Power supply	AC 230V/50Hz	Tested By	Chen Zexin
Test Date	2023-11-29	Sample No.	E20230331478001-0005

For ETSI EN 301 489-1/ ETSI EN 301489-3/ ETSI EN 301 489-17:

Frequency (MHz)	Field strength (V/m)	EUT orientation	Antenna polarization	Required criterion	Actual performance	Result
80~6000	3	Front	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass
		Left	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass
		Right	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass
		Rear	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass

NOTE: ¹⁾ Before test, during the test, and after test, the EUT working is normal, the EUT function is normal.

For EN 55035:

Frequency (MHz)	Field strength (V/m)	EUT orientation	Antenna polarization	Required criterion	Actual performance	Result
80~1000	3	Front	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass
		Left	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass
		Right	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass
		Rear	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass
		Front	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass
1800, 2600, 3500, 5000	3	Left	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass
		Right	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass
		Rear	H	Criterion A	Criterion A ¹⁾	pass
			V	Criterion A	Criterion A ¹⁾	pass

NOTE: ¹⁾ Before test, during the test, and after test, the EUT working is normal, the EUT function is normal.

7.6 ELECTRICAL FAST TRANSIENTS (EFT)

7.6.1 TEST SPECIFICATION

Test Requirement:	ETSI EN 301 489-1 ETSI EN 301 489-3 ETSI EN 301 489-17 EN 55035
Test Method:	EN 61000-4-4, IEC 61000-4-4
Test Voltage:	AC power Port: $\pm 1\text{kV}$ Signal Port: $\pm 0.5\text{kV}$
Polarity:	Positive and Negative
Impulse Frequency:	5 kHz
Impulse Wave-shape:	5 ns/50ns for voltage
Burst Duration:	15 ms
Burst Period:	300 ms
Test Duration:	1 min for each polarity
Performance criteria	B

7.6.2 TEST PROCEDURE

- a) Let the EUT work in test modes.
- b) Testing using the Electrical Fast Transients/Burst Generator controlled by computer.
- c) For each test, any degradation of performance shall be recorded.
- d) The duration time of each polarity was 1 minute. test voltage both polarities are mandatory.
- e) All cables to the EUT shall be placed on the insulation support 0.1 m above the ground reference plane.
- f) Either a direct coupling network or a capacitive clamp shall be used for the application of the test voltages. The test voltages shall be coupled to all of the EUT ports in turn including those between two units of equipment involved in the test, unless the length of the interconnecting cable makes it impossible to test.
- g) When using the coupling clamp, the minimum distance between the coupling plates and all other conductive surfaces (including the generator), except the ground reference plane beneath the coupling clamp and beneath the EUT, shall be at least 0.5 m.
- h) The distance between any coupling devices and the EUT shall be (0.5 - 0/+0.1) m for tabletop equipment testing, and (1.0 ± 0.1) m for floor standing equipment.
- i) The cable between the EUT and the coupling device, if detachable, shall be as short.
- j) If the manufacturer provides a cable exceeding the distance between the coupling device and the point of entry of the EUT, the excess length of this cable shall be bundled and situated at a distance of 0.1m above the ground reference plane. When a capacitive clamp is used as a coupling device, the excess cable length shall be bundled at the AE side.
- k) For table-top equipment
Table-top equipment and equipment normally mounted on ceilings or walls as well as built-in equipment shall be tested with the EUT located (0.1 ± 0.01) m above the ground reference plane.

Testing of large table-top equipment or multiple systems can be performed on the floor; maintaining the same distances as for the test setup of table-top equipment.

1) For floor-standing equipment

Floor standing EUTs and equipment designed to be mounted in other configurations, shall be placed on a ground reference plane and shall be insulated from it by an insulating support with a thickness of (0.1 ± 0.05) m including non-conductive roller/castors.

7.6.3 TEST SETUP

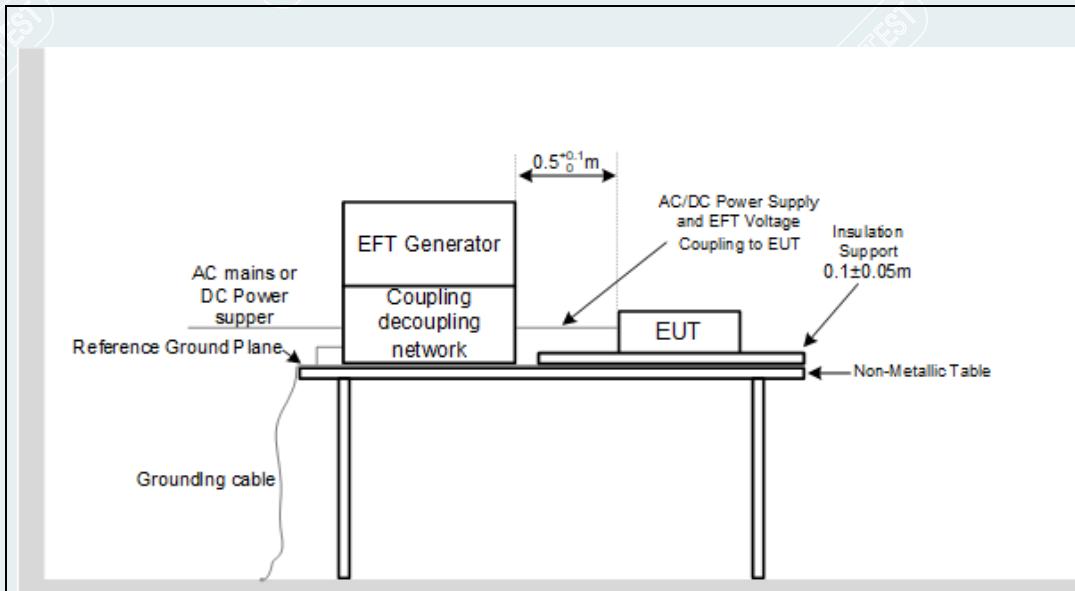


Figure 6.7 – Example measurement arrangement for table-top EUT
(AC mains power ports)

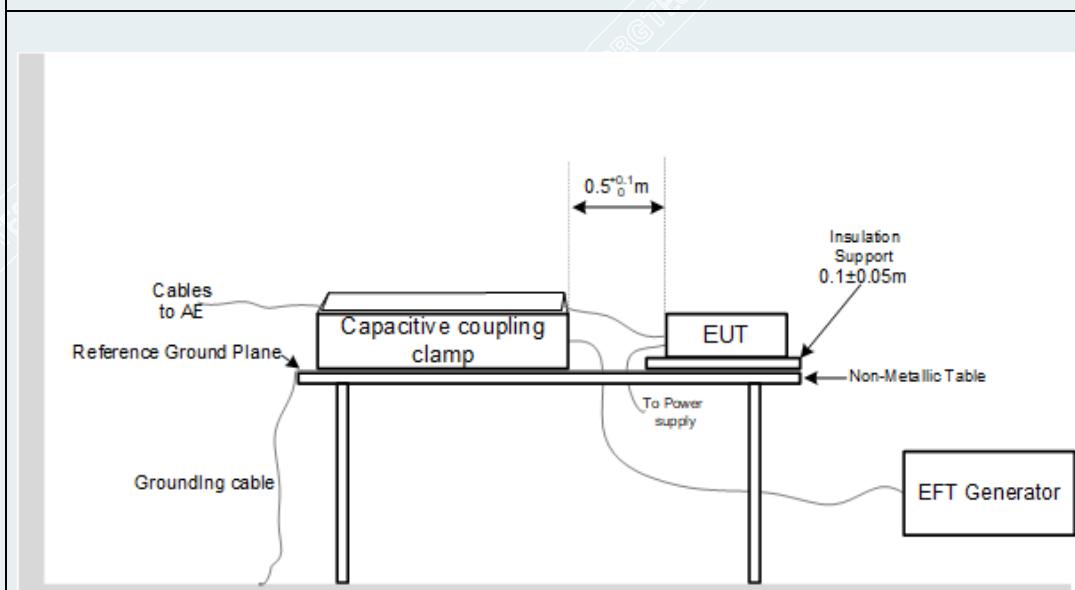


Figure 6.8 – Example measurement arrangement for table-top EUT
(Signal ports)

7.6.4 PHOTOGRAPH OF THE TEST ARRANGEMENT

Please refer to the attached document E20230331478001-28 CE-Test Photo.

----- The following blanks -----

7.6.5 TEST RESULTS

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	23.1°C/51%RH/101.0kPa	Test Mode	Mode 1
Power supply	AC 230V/50Hz	Tested By	Chen Zexin
Test Date	2023-12-04	Sample No.	E20230331478001-0005

For ETSI EN 301489-1/ ETSI EN 301489-3/ ETSI EN 301489-17/ EN 55035:

Test Point		Polarity	Test Level (kV)	Required Performance	Actual performance	Result
AC mains power port	L	+	1	Criterion B	Criterion A ¹⁾	PASS
		-	1	Criterion B	Criterion A ¹⁾	PASS
	N	+	1	Criterion B	Criterion A ¹⁾	PASS
		-	1	Criterion B	Criterion A ¹⁾	PASS
	L-N	+	1	Criterion B	Criterion A ¹⁾	PASS
		-	1	Criterion B	Criterion A ¹⁾	PASS

NOTE: ¹⁾Before test, during the test, and after test, the EUT working is normal, the EUT function is normal.

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	23.1°C/51%RH/101.0kPa	Test Mode	Mode 2
Power supply	AC 230V/50Hz	Tested By	Chen Zexin
Test Date	2023-12-04	Sample No.	E20230331478001-0005

For ETSI EN 301489-1/ ETSI EN 301489-3/ ETSI EN 301489-17/ EN 55035:

Test Point		Polarity	Test Level (kV)	Required Performance	Actual performance	Result
Signal port	+	0.5	Criterion B	Criterion A ¹⁾	PASS	PASS
		0.5	Criterion B	Criterion A ¹⁾	PASS	PASS

NOTE: ¹⁾Before test, during the test, and after test, the EUT working is normal, the EUT function is normal.

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	23.1°C/51%RH/101.0kPa	Test Mode	Mode 3
Power supply	AC 230V/50Hz	Tested By	Chen Zexin
Test Date	2023-12-04	Sample No.	E20230331478001-0005

For ETSI EN 301489-1/ ETSI EN 301489-3/ ETSI EN 301489-17/ EN 55035:

Test Point		Polarity	Test Level (kV)	Required Performance	Actual performance	Result
AC mains power port	L	+	1	Criterion B	Criterion A ¹⁾	PASS
		-	1	Criterion B	Criterion A ¹⁾	PASS
	N	+	1	Criterion B	Criterion A ¹⁾	PASS
		-	1	Criterion B	Criterion A ¹⁾	PASS
	L-N	+	1	Criterion B	Criterion A ¹⁾	PASS
		-	1	Criterion B	Criterion A ¹⁾	PASS

NOTE: ¹⁾Before test, during the test, and after test, the EUT working is normal, the EUT function is normal.

----- The following blanks -----

7.7 SURGES

7.7.1 TEST SPECIFICATION

Test Requirement:	ETSI EN 301 489-1 ETSI EN 301 489-3 ETSI EN 301 489-17 EN 55035
Test Method:	EN 61000-4-5, IEC 61000-4-5
Wave-Shape:	AC power supply port: Combination Wave 1.2/50 µs Open Circuit Voltage 8/20µs Short Circuit Current
Test Voltage:	AC Port: line to line: ±0.5 kV, ±1 kV
Generator Source Impedance:	AC power supply port: Line to line 2ohm
Polarity:	Positive and Negative
Phase Angle:	ETSI EN 301 489-1 / ETSI EN 301 489-3 / ETSI EN 301 489-17:0 °, 90 °, 180 °, 270 ° EN 55035: +90 °, -270 °
Pulse Repetition Rate:	1 minute
Number of tests:	5 positive and 5 negative at the selected points
Performance criteria	B

7.7.2 TEST PROCEDURE

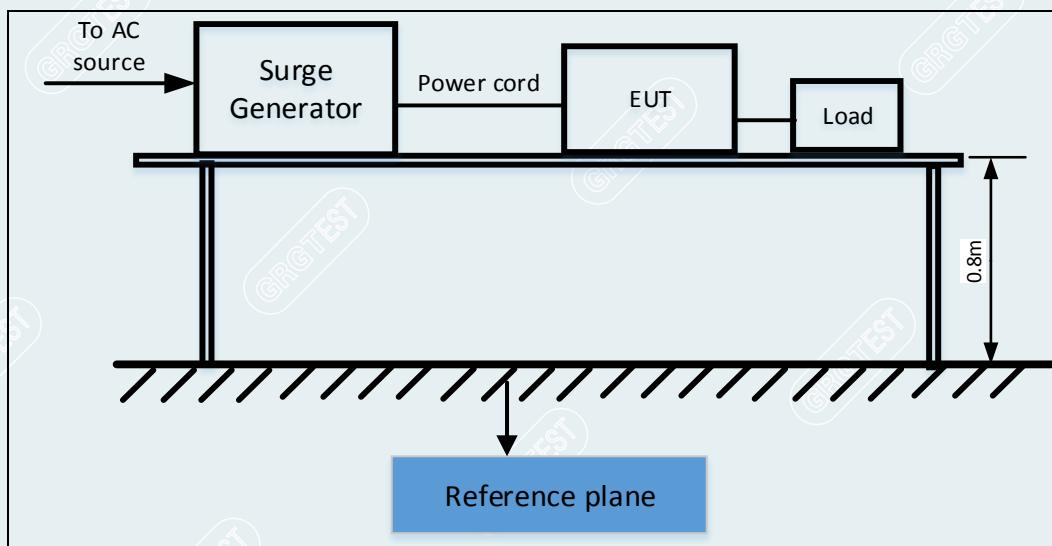
(1) For EUT power supply:

The surge is applied to the EUT power supply terminals via the capacitive coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines, and to provide sufficient decoupling impedance to the surge wave. The power cord between the EUT and the coupling/decoupling networks was shorter than 2 meters in length.

(2) For test applied to unshielded un-symmetrically operated interconnection lines of EUT: The surge was applied to the lines via the capacitive coupling. The coupling / decoupling networks didn't influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks was shorter than 2 meters in length.

(3) For test applied to unshielded symmetrically operated interconnection / telecommunication lines of EUT: The surge was applied to the lines via gas arrestors coupling. Test levels below the ignition point of the coupling arrestors were not specified. The interconnection line between the EUT and the coupling/decoupling networks was shorter than 2 meters in length.

7.7.3 TEST SETUP



----- The following blanks -----

7.7.4 PHOTOGRAPH OF THE TEST ARRANGEMENT

Please refer to the attached document E20230331478001-28 CE-Test Photo.

7.7.5 TEST RESULTS

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	23.1°C/51%RH/101.0kPa	Test Mode	Mode 1
Power supply	AC 230V/50Hz	Tested By	Chen Zexin
Test Date	2023-12-04	Sample No.	E20230331478001-0005

For ETSI EN 301489-1/ ETSI EN 301489-3/ ETSI EN 301489-17:

Test port	Polarity	Test Level	Phase	Required Performance	Actual performance	Result
L-N	+/-	0.5kV	0 °	Criterion B	Criterion A ¹⁾	PASS
	+/-	0.5kV	90 °	Criterion B	Criterion A ¹⁾	PASS
	+/-	0.5kV	180 °	Criterion B	Criterion A ¹⁾	PASS
	+/-	0.5kV	270 °	Criterion B	Criterion A ¹⁾	PASS
	+/-	1kV	0 °	Criterion B	Criterion A ¹⁾	PASS
	+/-	1kV	90 °	Criterion B	Criterion A ¹⁾	PASS
	+/-	1kV	180 °	Criterion B	Criterion A ¹⁾	PASS
	+/-	1kV	270 °	Criterion B	Criterion A ¹⁾	PASS

NOTE: ¹⁾Before test, during the test, and after test, the EUT working is normal, the EUT function is normal.

For EN 55035:

Test port	Polarity	Test Level	Phase	Required Performance	Actual performance	Result
L-N	+	0.5kV	90 °	Criterion B	Criterion A ¹⁾	PASS
	-	0.5kV	270 °	Criterion B	Criterion A ¹⁾	PASS
	+	1kV	90 °	Criterion B	Criterion A ¹⁾	PASS
	-	1kV	270 °	Criterion B	Criterion A ¹⁾	PASS

NOTE: ¹⁾Before test, during the test, and after test, the EUT working is normal, the EUT function is normal.

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	23.1°C/51%RH/101.0kPa	Test Mode	Mode 3
Power supply	AC 230V/50Hz	Tested By	Chen Zexin
Test Date	2023-12-04	Sample No.	E20230331478001-0005

For ETSI EN 301489-1/ ETSI EN 301489-3/ ETSI EN 301489-17:

Test port	Polarity	Test Level	Phase	Required Performance	Actual performance	Result
L-N	+/-	0.5kV	0 °	Criterion B	Criterion A ¹⁾	PASS
	+/-	0.5kV	90 °	Criterion B	Criterion A ¹⁾	PASS
	+/-	0.5kV	180 °	Criterion B	Criterion A ¹⁾	PASS
	+/-	0.5kV	270 °	Criterion B	Criterion A ¹⁾	PASS
	+/-	1kV	0 °	Criterion B	Criterion A ¹⁾	PASS
	+/-	1kV	90 °	Criterion B	Criterion A ¹⁾	PASS
	+/-	1kV	180 °	Criterion B	Criterion A ¹⁾	PASS
	+/-	1kV	270 °	Criterion B	Criterion A ¹⁾	PASS

NOTE: ¹⁾Before test, during the test, and after test, the EUT working is normal, the EUT function is normal.

For EN 55035:

Test port	Polarity	Test Level	Phase	Required Performance	Actual performance	Result
L-N	+	0.5kV	90 °	Criterion B	Criterion A ¹⁾	PASS
	-	0.5kV	270 °	Criterion B	Criterion A ¹⁾	PASS
	+	1kV	90 °	Criterion B	Criterion A ¹⁾	PASS
	-	1kV	270 °	Criterion B	Criterion A ¹⁾	PASS

NOTE: ¹⁾Before test, during the test, and after test, the EUT working is normal, the EUT function is normal.

7.8 RADIO FREQUENCY CONTINUOUS CONDUCTED (CS)

7.8.1 TEST SPECIFICATION

Test Requirement:	ETSI EN 301 489-1 ETSI EN 301 489-3 ETSI EN 301 489-17 EN 55035
Test Method:	EN 61000-4-6, IEC 61000-4-6
Frequency Range:	0.15 MHz~80 MHz
Field Strength:	AC mains power port/Signal port: ETSI EN 301 489-1 / ETSI EN 301 489-3 / ETSI EN 301 489-17: 0.15-80MHz: 3V (r.m.s), 80%, 1kHz EN 55035: 0.15-10MHz: 3V (r.m.s), 80%, 1kHz 10-30MHz: 3V (r.m.s), 80%, 1kHz 30-80MHz: 1V (r.m.s), 80%, 1kHz
Modulation:	1 kHz, 80% AM
Frequency Step:	1% of the preceding frequency value
Dwell Time:	1s
Performance criteria	A

7.8.2 TEST PROCEDURE

- (1) Set up the EUT, CDN as shown on Section 7.8.3.
- (2) Let the EUT work in test mode and measure it.
- (3) The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- (4) The disturbance signal described below is injected to EUT through CDN.
- (5) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- (6) The rate of sweep shall not exceed 1.5×10^{-3} decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- (7) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

7.8.3 TEST SETUP

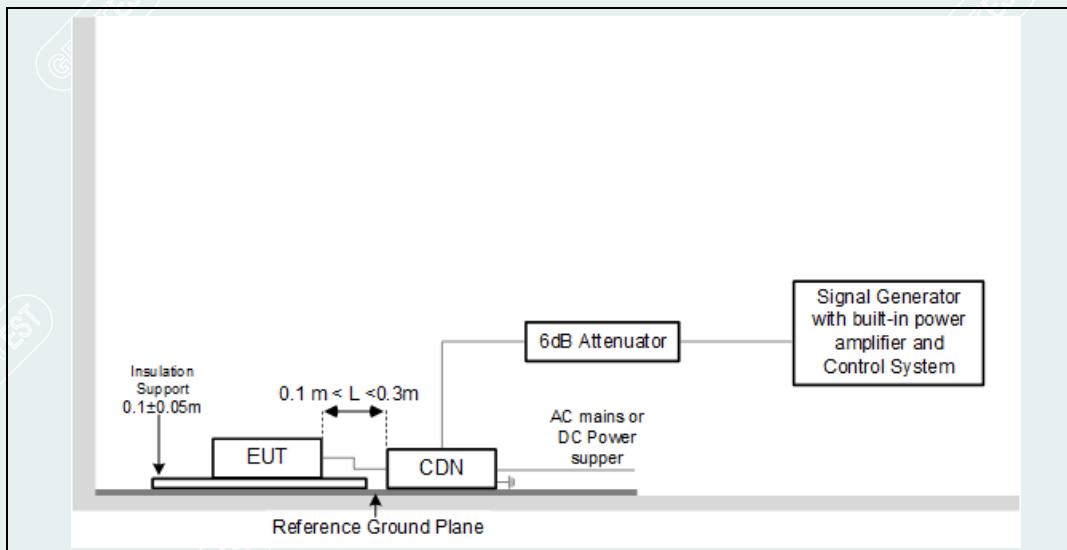


Figure 7.1 – Example measurement arrangement for used CDN
(CDNs for power supply lines)

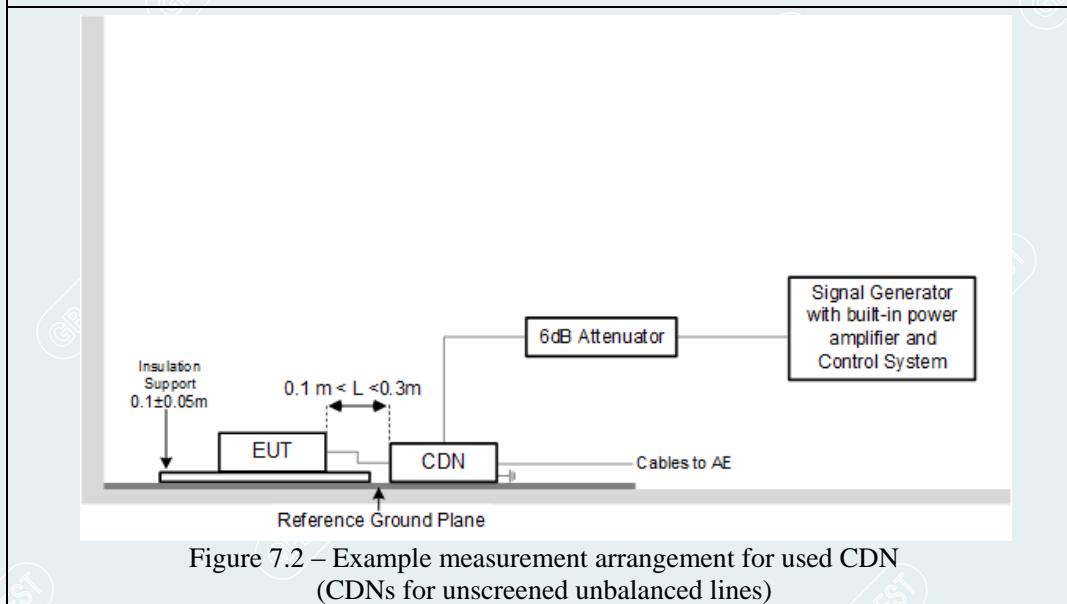


Figure 7.2 – Example measurement arrangement for used CDN
(CDNs for unscreened unbalanced lines)

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7.8.4 PHOTOGRAPH OF THE TEST ARRANGEMENT

Please refer to the attached document E20230331478001-28 CE-Test Photo.

7.8.5 TEST RESULTS

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	23.1°C/51%RH/101.0kPa	Test Mode	Mode 1
Power supply	AC 230V/50Hz	Tested By	Chen Zexin
Test Date	2023-12-04	Sample No.	E20230331478001-0005

For ETSI EN 301489-1/ ETSI EN 301489-3 /ETSI EN 301489-17:

Test Ports	Frequency Band(MHz)	Field Strength (Vrms)	Injection Method	Required Performance	Actual performance	Result
Power port	0.15~80	3	CDN	Criterion A	Criterion A ¹⁾	Pass

NOTE: ¹⁾ Before test, during the test, and after test, the EUT working is normal, the EUT function is normal.

For EN 55035:

Test Ports	Frequency Band(MHz)	Field Strength (Vrms)	Injection Method	Required Performance	Actual performance	Result
Power port	0.15~10	3	CDN	Criterion A	Criterion A ¹⁾	Pass
	10~30	3 to 1 ²⁾	CDN	Criterion A	Criterion A ¹⁾	Pass
	30~80	1	CDN	Criterion A	Criterion A ¹⁾	Pass

NOTE: ¹⁾ Before test, during the test, and after test, the EUT working is normal, the EUT function is normal.

²⁾The limit decreases linearly with the logarithm of the frequency in the range 10MHz to 30MHz.

----- The following blanks -----

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	23.1°C/51%RH/101.0kPa	Test Mode	Mode 2
Power supply	AC 230V/50Hz	Tested By	Chen Zexin
Test Date	2023-12-04	Sample No.	E20230331478001-0005

For ETSI EN 301489-1 / ETSI EN 301489-3/ETSI EN 301489-17:

Test Ports	Frequency Band(MHz)	Field Strength (Vrms)	Injection Method	Required Performance	Actual performance	Result
Signal port	0.15~80	3	CDN	Criterion A	Criterion A ¹⁾	Pass

NOTE: ¹⁾ Before test, during the test, and after test, the EUT working is normal, the EUT function is normal.

For EN 55035:

Test Ports	Frequency Band(MHz)	Field Strength (Vrms)	Injection Method	Required Performance	Actual performance	Result
Signal port	0.15~10	3	CDN	Criterion A	Criterion A ¹⁾	Pass
	10~30	3 to 1 ²⁾	CDN	Criterion A	Criterion A ¹⁾	Pass
	30~80	1	CDN	Criterion A	Criterion A ¹⁾	Pass

NOTE: ¹⁾ Before test, during the test, and after test, the EUT working is normal, the EUT function is normal.
²⁾The limit decreases linearly with the logarithm of the frequency in the range 10MHz to 30MHz.

----- The following blanks -----

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	23.1°C/51%RH/101.0kPa	Test Mode	Mode 3
Power supply	AC 230V/50Hz	Tested By	Chen Zexin
Test Date	2023-12-04	Sample No.	E20230331478001-0005

For ETSI EN 301489-1 / ETSI EN 301489-3/ETSI EN 301489-17:

Test Ports	Frequency Band(MHz)	Field Strength (Vrms)	Injection Method	Required Performance	Actual performance	Result
Power port	0.15~80	3	CDN	Criterion A	Criterion A ¹⁾	Pass

NOTE: ¹⁾ Before test, during the test, and after test, the EUT working is normal, the EUT function is normal.

For EN 55035:

Test Ports	Frequency Band(MHz)	Field Strength (Vrms)	Injection Method	Required Performance	Actual performance	Result
Power port	0.15~10	3	CDN	Criterion A	Criterion A ¹⁾	Pass
	10~30	3 to 1 ²⁾	CDN	Criterion A	Criterion A ¹⁾	Pass
	30~80	1	CDN	Criterion A	Criterion A ¹⁾	Pass

NOTE: ¹⁾ Before test, during the test, and after test, the EUT working is normal, the EUT function is normal.
²⁾The limit decreases linearly with the logarithm of the frequency in the range 10MHz to 30MHz.

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7.9 POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST

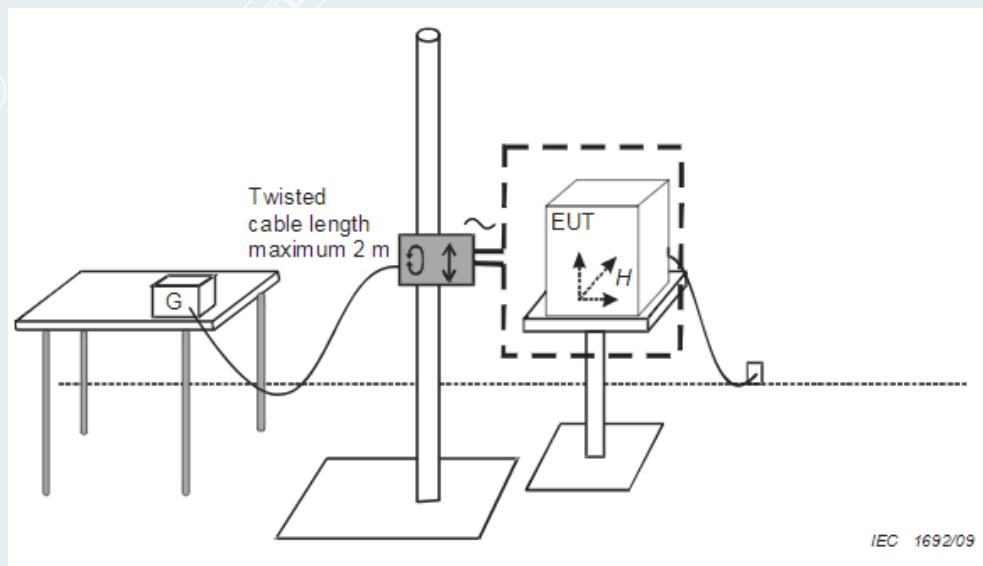
7.9.1 TEST SPECIFICATION

Test Requirement	EN 55035
Test Method	IEC 61000-4-8
Frequency	50Hz and 60Hz
Field Strength	1 A/m
Observation Time	5 min
Inductance Coil	Rectangular type, 1mx1m
Direction	X-axis, Y-axis, Z-axis
Performance criteria	A

7.9.2 TEST PROCEDURE

- a) The equipment is configured and connected to satisfy its functional requirements. It shall be placed on the GRP with the interposition of a 0.1m-thick insulating support.
- b) The equipment cabinets shall be connected to the safety earth directly on the GRP via the earth terminal of the EUT.
- c) The power supply, input and output circuits shall be connected to the sources of power supply, control and signal.
- d) The cables supplied or recommended by the equipment manufacturer shall be used. 1 meter of all cables used shall be exposed to the magnetic field.

7.9.3 TEST SETUP



7.9.4 PHOTOGRAPH OF THE TEST ARRANGEMENT

Please refer to the attached document E20230331478001-28 CE-Test Photo.

7.9.5 TEST RESULTS

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	23.7°C/55%RH/101.0kPa	Test Mode	Mode 1
Power supply	AC 230V/50Hz	Tested By	Chen Zexin
Test Date	2023-11-30	Sample No.	E20230331478001-0005

For EN 55035:

Field Strength (A/m)	Frequency (Hz)	Observation Time (min)	Direction	Required Performance	Actual performance	Result
1	50	5	X	A	A ¹⁾	PASS
1	50	5	Y	A	A ¹⁾	PASS
1	50	5	Z	A	A ¹⁾	PASS
1	60	5	X	A	A ¹⁾	PASS
1	60	5	Y	A	A ¹⁾	PASS
1	60	5	Z	A	A ¹⁾	PASS

Note:¹⁾ Before test, during test and after test, the EUT working is normal, the EUT function is normal.

----- The following blanks -----

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	23.7°C/55%RH/101.0kPa	Test Mode	Mode 2
Power supply	AC 230V/50Hz	Tested By	Chen Zexin
Test Date	2023-11-30	Sample No.	E20230331478001-0005

For EN 55035:

Field Strength (A/m)	Frequency (Hz)	Observation Time (min)	Direction	Required Performance	Actual performance	Result
1	50	5	X	A	A ¹⁾	PASS
1	50	5	Y	A	A ¹⁾	PASS
1	50	5	Z	A	A ¹⁾	PASS
1	60	5	X	A	A ¹⁾	PASS
1	60	5	Y	A	A ¹⁾	PASS
1	60	5	Z	A	A ¹⁾	PASS

Note:¹⁾ Before test, during test and after test, the EUT working is normal, the EUT function is normal.

----- The following blanks -----

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	23.7°C/55%RH/101.0kPa	Test Mode	Mode 3
Power supply	AC 230V/50Hz	Tested By	Chen Zexin
Test Date	2023-11-30	Sample No.	E20230331478001-0005

For EN 55035:

Field Strength (A/m)	Frequency (Hz)	Observation Time (min)	Direction	Required Performance	Actual performance	Result
1	50	5	X	A	A ¹⁾	PASS
1	50	5	Y	A	A ¹⁾	PASS
1	50	5	Z	A	A ¹⁾	PASS
1	60	5	X	A	A ¹⁾	PASS
1	60	5	Y	A	A ¹⁾	PASS
1	60	5	Z	A	A ¹⁾	PASS

Note:¹⁾ Before test, during test and after test, the EUT working is normal, the EUT function is normal.

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7.10 VOLTAGE DIPS & SHORT INTERRUPTIONS

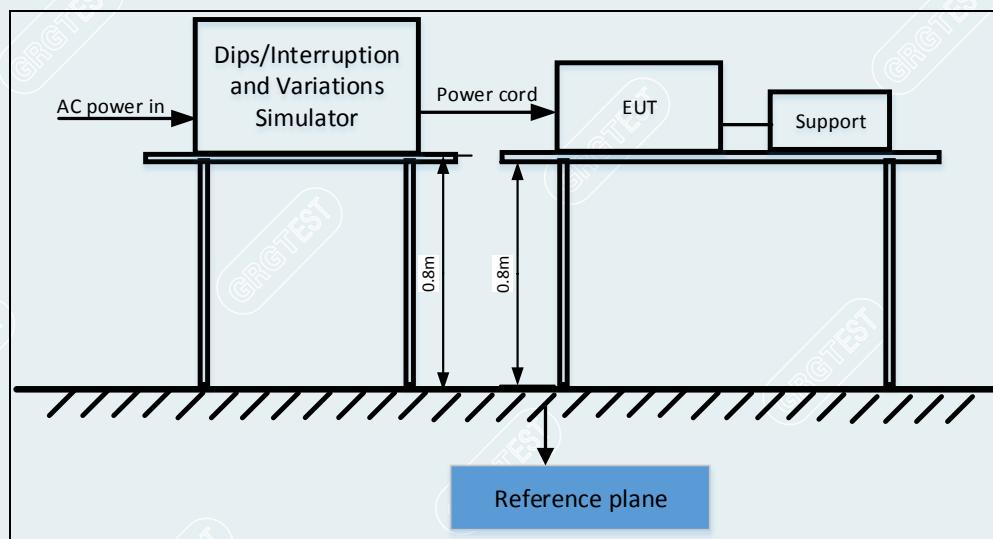
7.10.1 TEST SPECIFICATION

Test Requirement:	ETSI EN 301 489-1 ETSI EN 301 489-3 ETSI EN 301 489-17 EN 55035
Test Method:	EN 61000-4-11, IEC 61000-4-11
Test duration time:	ETSI EN 301 489-1 / ETSI EN 301 489-3 / ETSI EN 301 489-17 Test specification: 1. Voltage dips: i) 0% residual voltage 0.5 cycle. Performance: Criteria B; ii) 0% residual voltage 1 cycle, Performance: Criteria B; iii) 70% residual voltage 25 cycle. Performance: Criteria C; 2. Voltage interruption: 0% residual voltage during 250 cycles. Performance: Criteria C; EN 55035 Test specification: 1. Voltage dips: i) 0% residual voltage 0.5 cycle. Performance: Criteria B; ii) 70% residual voltage 25 cycle. Performance: Criteria C; 2. Voltage interruption: 0% residual voltage during 250 cycles. Performance: Criteria C
Interval between event:	10s for each dips at each test angle
Phase Angle:	EN 55035: 0 °, 180 ° ETSI EN 301 489-1 / ETSI EN 301 489-3 / ETSI EN 301 489-17: 0 °, 180 °
Test cycle:	3

7.10.2 TEST PROCEDURE

- (1) The EUT and test generator were setup as shown on Section 7.10.3.
- (2) The interruption is introduced at selected phase angles with specified duration.
- (3) Record any degradation of performance.

7.10.3 TEST SETUP



----- The following blanks -----

7.10.4 PHOTOGRAPH OF THE TEST ARRANGEMENT

Please refer to the attached document E20230331478001-28 CE-Test Photo.

7.10.5 TEST RESULTS

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	23.7°C/55%RH/101.0kPa	Test Mode	Mode 1
Power supply	AC 230V/50Hz	Tested By	Chen Zexin
Test Date	2023-11-30	Sample No.	E20230331478001-0005

For ETSI EN 301489-1/ ETSI EN 301489-3/ ETSI EN 301489-17:

Voltage(%Residual)	Duration (Period)	Angle	Required Performance	Actual performance	Result
Voltage dips	0	0 °, 180 °	Criterion B	Criterion A ¹⁾	PASS
	0	0 °, 180 °	Criterion B	Criterion A ¹⁾	PASS
	70	25	Criterion C	Criterion A ¹⁾	PASS
Voltage interruptions	0	250	Criterion C	Criterion B ²⁾	PASS

Note:¹⁾ Before test, during test and after test, the EUT working is normal, the EUT function is normal.
²⁾ Before test and after test, the EUT working is normal, the EUT function is normal, the power is shut down during test and it can automatic restores normally.

For EN 55035:

Voltage(%Residual)	Duration (Period)	Angle	Required Performance	Actual performance	Result
Voltage dips	0	0 °, 180 °	Criterion B	Criterion A ¹⁾	PASS
	70	25	Criterion C	Criterion A ¹⁾	PASS
Voltage interruptions	0	250	Criterion C	Criterion B ²⁾	PASS

Note:¹⁾ Before test, during test and after test, the EUT working is normal, the EUT function is normal.
²⁾ Before test and after test, the EUT working is normal, the EUT function is normal, the power is shut down during test and it can automatic restores normally.

EUT Name	Hub M3	Model	HM-G01E
Environmental Conditions	23.7°C/55%RH/101.0kPa	Test Mode	Mode 3
Power supply	AC 230V/50Hz	Tested By	Chen Zexin
Test Date	2023-11-30	Sample No.	E20230331478001-0005

For ETSI EN 301489-1/ ETSI EN 301489-3/ ETSI EN 301489-17:

Voltage(%Residual)		Duration (Period)	Angle	Required Performance	Actual performance	Result
Voltage dips	0	0.5	0 °, 180 °	Criterion B	Criterion A ¹⁾	PASS
	0	1	0 °, 180 °	Criterion B	Criterion A ¹⁾	PASS
	70	25	0 °, 180 °	Criterion C	Criterion A ¹⁾	PASS
Voltage interruptions	0	250	0 °, 180 °	Criterion C	Criterion B ²⁾	PASS

Note:¹⁾ Before test, during test and after test, the EUT working is normal, the EUT function is normal.
²⁾ Before test and after test, the EUT working is normal, the EUT function is normal, the power is shut down during test and it can automatic restores normally.

For EN 55035:

Voltage(%Residual)		Duration (Period)	Angle	Required Performance	Actual performance	Result
Voltage dips	0	0.5	0 °, 180 °	Criterion B	Criterion A ¹⁾	PASS
	70	25	0 °, 180 °	Criterion C	Criterion A ¹⁾	PASS
Voltage interruptions	0	250	0 °, 180 °	Criterion C	Criterion B ²⁾	PASS

Note:¹⁾ Before test, during test and after test, the EUT working is normal, the EUT function is normal.
²⁾ Before test and after test, the EUT working is normal, the EUT function is normal, the power is shut down during test and it can automatic restores normally.

APPENDIX A. PHOTOGRAPHS OF EUT

Please refer to the attached document E20230331478001-29 EUT photo.

----- End of Report -----